University of Fort Hare
Together in Excellence

INFORMATION NEEDS AND INFORMATION-SEEKING BEHAVIOUR OF

PRACTISING MEDICAL DOCTORS AT KATUTURA AND WINDHOEK

CENTRAL STATE HOSPITALS IN NAMIBIA

David MATSVERU

STUDENT ID: 201402305

A thesis submitted in fulfilment of the requirements for the degree of Doctor of

Philosophy in Library and Information Science, Faculty of Social Science and

Humanities, University of Fort Hare

Supervisors:	**Prof E M Ondari-Okemwa**
	Prof F H Nekhwevha
Co-supervisor:	**Dr G O Salubi**

June 2019

Declaration

This certifies that I, David Matsveru, am responsible for the work submitted in this thesis. The original work is my own except as specified in acknowledgements. I would also want to confirm that this work has not been submitted to any other institution for a degree.

30 April 2020

………………………………   …………………..

Signature   **Date**

University of Fort Hare
Together in Excellence

Acknowledgements

I give thanks and glory to God for the grace He granted me throughout this study. It has not been an easy journey as I felt lonely in most cases but each time I remembered God's word I was encouraged to know that God is always with me.

I would also like to thank the following people who stood with me to bring this thesis to completion:

Prof Fhulu Nekhwevha and Dr Oghenere Gabriel Salubi – for guiding me through and helping me to finish what Prof Ezra Ondari-Okemwa had left.

Prof Ezra Ondari-Okemwa – for a good start and encouragement.

My gratitude goes to the Govan Mbeki Research and Development Centre for providing the financial support through a 'Supervisor-linked Bursary' facilitated by Professor Ezra Ondari-Okemwa, which enabled me to travel to Fort Hare University to present my proposal.

The Ministry of Health and Social Services Namibia as well as the Superintendents of Katutura and Windhoek Central state hospitals for granting me permission to conduct the study.

Ohangwena Regional Library – from where I got my information sources.

Mrs. Lorna Neuman for assisting me with the distribution of questionnaires at Windhoek Central Hospital.

Dedication

I dedicate this thesis to Florence (my wife), Lauretta (my daughter) and Kundaimunashe (my son whose soul went to be with the Lord while I was in the process of writing this thesis) in appreciation for their patience, support and understanding, which brought this thesis to completion.

My very special dedication goes to my mother (Lucia Matsveru) - for inspiring me since my childhood not to give up when I set my heart on something until I accomplish it.

Chapter demarcation

The chapters in this thesis are outlined as follows:

Chapter One: Background to the study

No empirical study was found on the information needs and information seeking behaviour of practising medical doctors in Namibia; hence, this study was conducted to fill this gap.

This chapter sets the scene for the entire study. It includes the general introduction to the research, the research problem, the objectives, research questions, the significance of the study, and the definition of terms and delimitations.

Chapter Two: Literature review

Studies by Al-Dousari (2009) and Tunde (2016) were used as key literature sources for this study.

This chapter presents a review of international, continental and local (Namibian) literature relevant to the information needs and information-seeking behaviour of medical doctors. It identifies the range of information sources used by doctors and the contextual problems doctors face in obtaining the information they need. The chapter also identifies theoretical frameworks and research methodologies that were used by other researchers.

Chapter Three: Theoretical framework

This chapter presents different theories of information-seeking behaviour (Ellis, 1989; Kuhlthau, 1991; Dervin, 2000; Wilson, 1996), mainly focusing on Wilson's model, upon which this study was based.

The chapter also gives reasons why Wilson's model was chosen as the theoretical framework for this study. Wilson's model states that the rise of a particular need is influenced by the context, which can be the person himself/herself, or the role the person plays at work or in life. Intervening variables, such as psychological factors; demographic background; and factors related to one's social role, environment and information source characteristics, might motivate or hinder information seeking. The risk or reward involved may also lead to an active or passive information-seeking behaviour.

Chapter Four: Research design and methodology

A mixed-methods approach was used to conduct this study. The mixed-methods approach minimises the weaknesses and draws from the strengths of an inclusively qualitative or quantitative research methodology.

This chapter presents the research design and methodology used in the study. The data collection procedure, data analysis and the limitations, validity and reliability of the study are evaluated and discussed here.

Chapter Five: Information needs of practising medical doctors at Katutura and Windhoek Central state hospitals

This chapter addresses Objective 1 of the study, which was to identify the information needs of doctors at Katutura and Windhoek Central state hospitals.

The study has revealed that medical doctors need information primarily to enhance their clinical decision-making, to keep up-to-date, to improve their professional knowledge, and to continue education. It seems from the results that satisfying these needs is likely to help doctors to satisfy the information need for improving clinical decision-making.

Chapter Six: Information-seeking behaviour and information sources used by practising medical doctors at Katutura and Windhoek Central state hospitals

This chapter addresses Objectives 2 and 3 of the study, which were: to find out how practising medical doctors at Katutura and Windhoek Central state hospitals seek information, and to identify the information sources used by practising medical doctors at Katutura and Windhoek Central state hospitals.

The doctors' information-seeking behaviour is influenced by the availability, accessibility, and trustworthiness of these sources and resources, which Wilson (1999) refers to as intervening variables. Results show that practising medical doctors at Katutura and Windhoek Central state hospitals do not use hospital libraries because there is no library at Windhoek Central Hospital and the one at Katutura Hospital is not well equipped.

Chapter Seven: Factors affecting practising medical doctors at the two hospitals in accessing and acquiring information

This chapter addresses Objective 4 of the study, which was to identify factors affecting practising medical doctors at Katutura and Windhoek Central state hospitals in accessing and acquiring information for their medical practice.

In this study, the main factors affecting information-seeking behaviour were language problems, lack of patients' understanding of medical terms, unavailable or inadequate library resources, missing or inaccessible medical records, and lack of time.

Wilson's (1999) model of information-seeking behaviour, upon which this study is anchored, further notes that intervening variables, such as language issues, environment, and accessibility issues might hinder information seeking.

Chapter Eight: Degree of satisfaction by practising medical doctors at the two hospitals with health information resources and services and areas identified for improvement

This chapter addresses Objective 5 of the study, which sought to find out how health information service provision may be improved.

Results of this study are that doctors are highly satisfied with communication with their colleagues and patients. However, doctors are not satisfied with the library services and information technology at the two hospitals. Majority of the doctors indicated that health education for patients is needed as a way of

improving health information services at Katutura and Windhoek Central state hospitals.

According to Wilson's (1996) model of information-seeking behaviour, availability, accessibility, and credibility of information sources and resources might motivate or hinder information seeking.

Chapter Nine: Summary, conclusions, recommendations, and future areas of study

This chapter summarises the study and makes relevant conclusions and recommendations based on the findings of the study. Objective 6 is also addressed in this chapter.

The aim of the study was to find out the information needs and the information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals in order to improve their medical information needs. The study revealed that improving clinical decision-making, keeping up-to-date, improving knowledge, and continuing education are the main information needs of doctors at Katutura and Windhoek Central state hospitals. The use of personal collections and the Internet is preferred compared to the use of libraries. Language problems in communicating with patients/ patient's relatives, lack of patients' understanding of medical terms, unavailability of libraries, and missing patients' files are some of the factors that affect doctors' information seeking. While doctors are satisfied with their communication with their colleagues, the lack of information technology puts them at a disadvantage. The medical doctors

are generally not satisfied with the library services in the hospitals as there is no library at Windhoek Central Hospital, while the one at Katutura Hospital is not well equipped.

The doctors suggested provision of health education to patients; setting an environment where doctors can communicate with other local and international hospitals; providing functional medical hospital libraries; training and providing qualified library staff; and training doctors on the use of the Internet and ICTs as ways to improve current health information services.

As Wilson (1999) notes, the rise of a particular need is influenced by the context in which one finds himself or herself. Intervening variables, such as psychological factors; demographic background; and factors related to one's social role, environmental characteristics, and information source characteristics, might motivate or hinder information seeking.

Abstract

This study investigated the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central hospitals in Namibia. Anchored on Wilson's (1996) model of information-seeking behaviour, the purpose of the study was to establish the information required by practising medical doctors to carry out their work, how they seek information, the information sources and resources they use, and the factors that affect them as they do so. Understanding users' information needs and the way information is disseminated in hospitals is necessary in developing an effective information provision system and ensuring the quality of information services in the hospitals.

A mixed-methods research approach was used to meet the objectives of the study. Questionnaires were administered on 140 practising medical doctors at Katutura and Windhoek Central state hospitals, while fifteen doctors were interviewed telephonically, using a semi-structured interview guide. IBM SPSS (Version 25) was used to analyse quantitative data from the questionnaires, while content analysis was used to analyse qualitative data from the interviews.

The findings of this research are that practising medical doctors need information mainly for improving clinical decision-making, keeping up-to-date, improving professional knowledge, and continuing education.

The study also revealed that medical doctors use a variety of information sources and resources. However, the degree to which information sources are

used depends on the clinical context (outpatients, wards and casualty/emergency).

Some contextual factors (organisational context, socio-cultural context, and information sources) can either support or hinder doctors in seeking the information they need. The patient is one of the primary information sources for medical doctors. However, language problems are a significant challenge in communicating with patients or patients' relatives. Lack of patients' understanding of medical terms and unavailability of properly run libraries in hospitals are some of the factors that affect doctors' information-seeking behaviour. Participants recommended health education for patients, training of medical doctors on the use of the Internet and ICT, provision of properly run hospital libraries, and improved communication with other international hospitals as some of the ways to improve health information sources and services.

Three related models were drawn from the study's findings, based on Wilson's (1996) model and literature, namely, the doctors' decision-making model (DDmM), the clinical context information sources model (CCISM), and the model of information needs and information-seeking behaviour of medical doctors (MINISBMD).

The thesis concludes with practical recommendations to enhance the provision of information at Katutura and Windhoek Central hospitals and suggestions for further research.

Acronyms and abbreviations

CCISM	Clinical context information source model
CINAHL	Cumulative Index to Nursing and Allied Health Literature
DDmM	Doctors' decision-making model
EBM	Evidence-based medicine
EHR	Electronic health record
HCs	Health centres
HPs	Health posts
HR	Human Resources
ICT	Information and communication technology
INs	Information needs
ISB	Information-seeking behaviour
KIRH	Katutura Intermediate Referral Hospital
LCs	Large clinics
LISA	Library and Information Science Abstracts
LISTA	Library and Information Science and Technology Abstracts
MINISBMD	Model of information needs and information-seeking behaviour of medical doctors
MISB	Model of information-seeking behaviour
MOHSS	Ministry of Health and Social Services
NLAS	Namibia Libraries and Archives Services
OVC	Orphans and Vulnerable Children
PC	Primary Care
SC	Secondary Care
SCs	Small clinics
SMT	Sense-making theory
TC	Tertiary Care
UK	United Kingdom
USA	United States of America

Table of Contents

List of tables

List of figures

CHAPTER 1: BACKGROUND TO THE STUDY

1.1 Introduction

Using Wilson's (1996) model of information-seeking behaviour as the theoretical framework, this study is set out to establish the information needs and information-seeking behaviour of practising medical doctors at the Katutura and Windhoek Central State hospitals in Namibia. The two hospitals are located in the capital city, Windhoek, which is in Khomas Region. Khomas Region is in the central part of Namibia as shown in Figure 1.1 below.
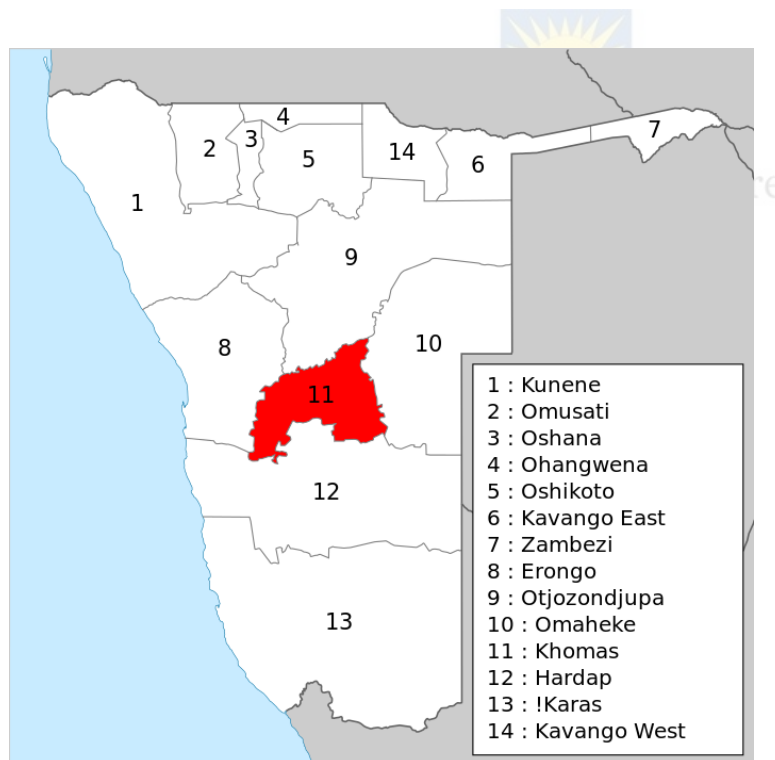
Figure 1.1: Map of Namibia

(Source: Ministry of Urban and Rural Development [MURD], 2017)

Access to and use of medical information by practising medical doctors in Namibia is of critical importance if they are to provide quality health services to patients. Although practising medical doctors in Namibia may be aware of many different diseases that they encounter during their clinical practices, newer forms and strains of diseases, strange symptoms and unknown ailments, among other factors, can result in medical doctors engaging in information seeking activities. It is, therefore, necessary for scholars to examine the information needs and information-seeking behaviour of practising medical doctors to enable information service providers to provide better information services to this class of information users.

This chapter introduces the thesis by giving the background to the study; research problem; research aim, objectives, and questions; definition of terms; research methodology; validity and reliability test; significance of the study; ethical considerations; and delimitations of the study.

1.2 Background

After independence, the Government of Namibia adopted the primary health care approach with the aim of achieving health for all Namibians by 2030. To achieve this, the referral system was introduced. The Ministry of Health and Social Services (MOHSS) as the principal provider of health care services is responsible for ensuring that the health care system is managed correctly. The health care system is divided into three main levels of health care delivery, namely, primary, secondary, and tertiary. About the referral system, patients are referred from the primary level to the secondary and tertiary levels. All health

facilities are classified from A to F, ranging from the National (Windhoek Central) hospital as a Class A facility to Outreach Service Points, which are Class F health facilities (Tjingaete, 1998).

Figure 1.2: Windhoek Central Hospital

(Source: My Namibia, 2015)

There are no stationed doctors in health centres (HCs) and clinics; therefore, clinics refer patients directly to district hospitals rather than to HCs. District hospitals refer patients to regional hospitals, which in turn refer their patients to intermediate hospitals. There are only three intermediate referral hospitals countrywide, namely, Katutura, Oshakati, and Rundu. The Katutura Intermediate Referral Hospital (KIRH) also acts as a national referral hospital, as both the

Oshakati and Rundu hospitals refer patients to KIRH. KIRH has specialist wards with specialist positions catered for at its establishments as well as providing a range of specialist medical services. However, if no specialised wards are found at Katutura State Hospital, all cases requiring specialised treatment will be referred to the Windhoek Central Hospital, which is the national hospital.

Figure 1.3: Katutura State Hospital

(Source: Team Namibia, 2013)

Katutura State Hospital is situated in Katutura, a high-density suburb in Windhoek where mostly black people reside. The hospital was built in 1973. It is one of the two state hospitals and Namibia's only general referral hospital (Haidula, 27 Jan 2015; Kandjeke, 2012).

1.2.1 Types of health facilities in Namibia

Below is a description of the roles and classification of health facilities in the Namibian referral system as outlined by Tjingaete (1998):

Health posts (HPs): These are remote units usually staffed by health workers who come from the communities in which the health posts are located. The functions of HPs include health education and promotion, environmental sanitation, and treatment of simple injuries and common diseases (Tjingaete, 1998).

Small clinics (SCs): These are the smallest health facilities permanently staffed by salaried health workers. They provide maternal and child care services, family planning services, nutrition promotion, treatment of common diseases, and basic emergencies. SCs are equipped with furniture, storage facilities for medicines and clinical supplies, radio/telephone, medical equipment, and cold chain equipment (Tjingaete, 1998).

Large clinics (LCs): These have a maximum of three beds, and they provide routine maternity services for low-risk cases and outreach services (school health, oral health, mental health, eye care, rehabilitation, and social services). They provide services for 40 hours per week and are available for emergencies on a 24-hour basis. LCs are staffed with at least one registered nurse and enrolled nurses (Tjingaete, 1998).

Health centres: These facilities are bigger than 'large clinics' but smaller than district hospitals. They have a maximum of ten beds. Health centres cater for

natural (baby) deliveries, short illnesses, which require observation up to a maximum of 48 hours. Day-care health centres are usually found in larger municipal areas and provide day care. They do not admit patients, but they usually have the benefit of more regular visits by a medical practitioner; hence, they are equipped with X-ray facilities, laboratory, operating theatre equipment, and equipment for in-patient care (Tjingaete, 1998).

District hospitals: These are the ultimate referral point at the district level. They provide essential backup support services to health centres and clinics. District hospitals provide comprehensive 24-hour services. Some of the services include treatment of common diseases, emergency treatment, maternity and childcare, basic surgery, etc. (Tjingaete, 1998).

Regional hospitals: Regional hospitals provide specialised health care services and act as referral hospitals within the regions. The services include, among others, paediatric services, obstetrics and gynaecology, general surgery, internal medicine, psychiatry, and anaesthesia, etc. (Tjingaete, 1998).

National referral hospitals: There are two national referral hospitals in Namibia, namely, Katutura Hospital and Windhoek Central Hospital. Katutura Hospital is also the regional hospital for the Khomas region. The following specialists render services at the national referral hospitals: paediatricians, physicians, obstetricians and gynaecologists, general surgeons, and oncologists (Tjingaete, 1998).

All severe cases are finally referred to Katutura Hospital or Windhoek Central Hospital.

The above descriptions of roles and classification of health facilities in the Namibian referral system were summarised from Tjingaete (1998).

1.2.2 Importance of studying the information needs (INs) and information-seeking behaviour (ISB) of medical doctors

A study of doctors' INs and ISB is essential. Both primary care and hospital doctors practise medicine and contribute to improving the health of society by providing needed health services. The nature of duties of these doctors varies. Primary health care doctors are responsible for defining the diagnosis of the patient and then referring them to the secondary care doctors for suitable treatment. The secondary care doctor may refer the patient for further tertiary diagnosis (TrioTree Technologies, 2018).

Primary Care (PC) is usually the entry point for healthcare services. It is performed by clinicians who are responsible for addressing the patient's overall healthcare needs. PC practitioners are trained to:

- Foster trust and open communication;

- Provide screening, prevention, diagnosis, and treatment for acute and chronic health problems;

- Coordinate healthcare; and

31

- Work with patients of all ages and with all kinds of physical, mental, and social health issues (TrioTree Technologies, 2018).

The PC doctor is the patient's gatekeeper to healthcare. If there is a need, the primary care doctor refers the patient for secondary or tertiary care treatment. The referral process is illustrated in Figure 1.4 below.
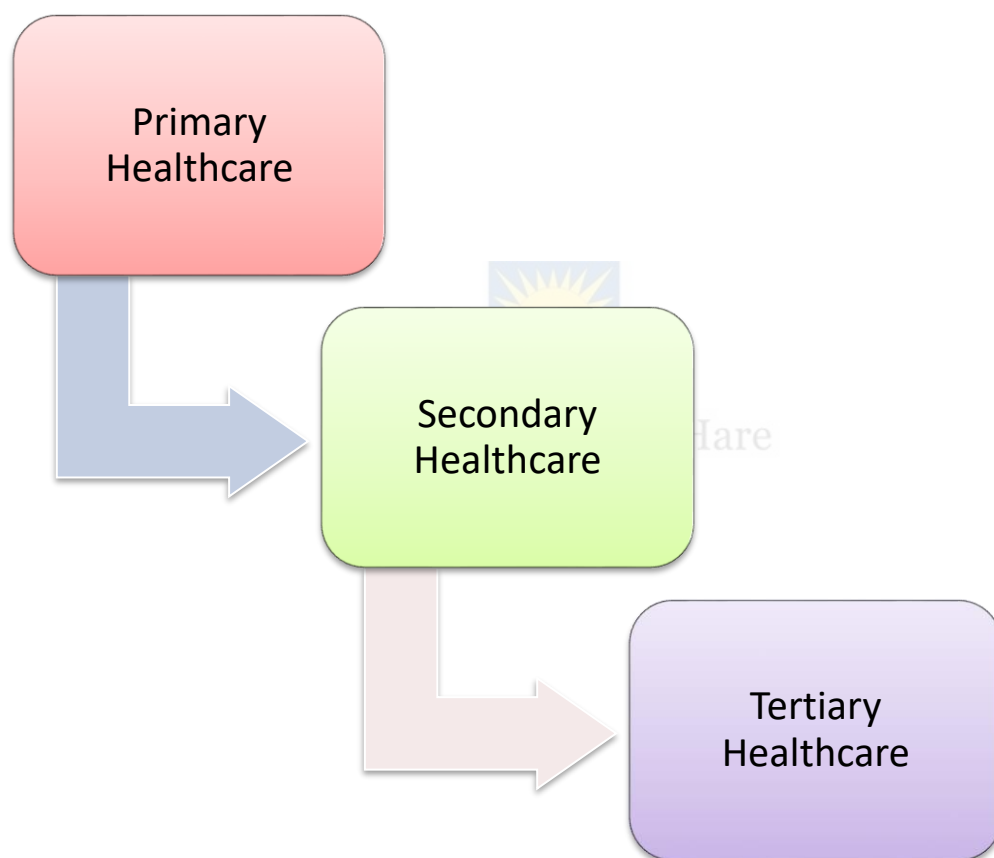
Figure 1.4: Namibian health care referral system

(Source: Researcher, based on the information above)

Secondary Care (SC) is treatment by specialists to whom a patient has been referred by a PC provider. SC is provided by hospitals and by physicians and

facilities that specialise in areas of medicine such as cardiology, dermatology, and psychology. If, at any point, a patient's SC provider determines that the patient requires more advanced treatment, the specialist can refer the patient to a health care provider at the tertiary level (TrioTree Technologies, 2018).

Tertiary Care (TC) is health care delivered by specialists who work for a facility that performs specialty health care research, development, and treatment. TC provides advanced health care facilities, tools, drugs, staff, clinicians, and treatments for patients who have conditions that are difficult to treat and who have been referred by primary or secondary care doctors (TrioTree Technologies, 2018).

TC facilities provide patients with access to: advanced medical research and treatment; physicians with highly specialised areas of expertise, usually very heavily involved in research and development; specialised health care equipment, facilities, clinicians, and personnel; trials of experimental drugs and devices; and healthcare resources that would not be available at a general hospital or medical centre (TrioTree Technologies, 2018).

Medical doctors need to access current, contextual, and reliable information promptly in response to health INs as they arise (Flynn & McGuinness, 2010). Lwoga and Matovelo (2005) have pointed out that doctors in developing countries have trouble accessing information that could improve the quality of their work. Their biggest challenge is information overload as health information doubles every 20 years (Wyatt & Sullivan, 2005). Access to different information

resources and adequate information searching skills are important if the doctors are to meet their INs sufficiently.

In spite of the growing emphasis on Evidence-Based Medicine (EBM) in health care, no research has been carried out on INs and ISB of practising medical doctors in Namibia. This study sought to address the knowledge gap in the literature by identifying the information needs of doctors during their daily clinical practices and understanding the information-seeking behaviour they adopt as they try to satisfy such needs. The research was carried out at Katutura and Windhoek Central state hospitals in Windhoek, Namibia.

1.2.3   Information needs and information-seeking behaviour

An individual may be forced to engage in information-seeking behaviour in an endeavour to fulfil his or her information needs (Wilson, 1981). Information need refers to the recognition that personal knowledge is inadequate to satisfy a goal that needs to be achieved (Case, 2006). According to Wilson (2000), information needs can be physiological, or emotional and cognitive. Depending on personal and contextual factors, these needs may translate into information-seeking behaviour as individuals respond to their information needs.

During information seeking, the individual may interact with a manual information system or a computerised information system (Wilson, 2000). Norbert and Lwoga (2012), in their study on information-seeking behaviour of physicians in Tanzania, found that the major characteristics of health ISB includes the type and amount of health-related information sought, the specifications implemented to obtain the information, and the sources that the individuals use. This study

sought to identify the information needs, information sources, factors affecting ISB, and circumstances under which practising medical doctors need information.

1.2.4 Information sources used by medical doctors

Medical doctors use a variety of sources when they need information.

A study by Andualem, Kebede, and Kumie (2013) revealed that medical doctors use both formal (e.g. textbooks and protocol manuals) and informal sources (such as colleagues). Vali and Esmail (2014) further found that doctors dependent on evidence-based and regularly updated textbooks.

Studies by Kapiriri and Bondy (2006) and Younger (2010) have confirmed that medical doctors use colleagues as their first source of information. However, another study by Jackson et al. (2007) has shown that this trend is changing, as the Internet is becoming a popular information source for doctors.

The Internet is a unique information medium, allowing information to be accessed at any time and from anywhere in the world. Information and communication technology (ICT) has become an important element in the working life of any health care service provider. Fors, Kohane, Long, and Moreno (2002) in their article entitled 'The benefits and obstacles of implementing ICTs strategies for development from Bottom-Up Approach' have pointed out that ICT reduces isolation, facilitates international cooperation, and provides access to vast amounts of information at a lower cost.

Studies by Khudair and Cooke (2008) and Jacko, Sears, and Sorensen (2001) have revealed that health personnel are enthusiastic about using the Internet because of its ease of use, fast communication features, and its ability to provide current and relevant information, promptly, from a multitude of sources. Although the situation sounds good, there are challenges with ICT. According to Khudair and Cooke (2008), the major obstacle to using health information is that of accessing and using online databases to support decision-making.

Podichetty, Booher, Whitfield, and Biscup (2006) have confirmed in their article, 'Assessment of Internet use and effects among healthcare professionals: a cross-sectional survey', that the Internet and the web-based health electronic information sources are commonly used among health professionals. However, a study by Khalid (2000) on 'The use of technology for house-keeping and bibliographic searching activities in university libraries of Saudi Arabia: the need for acceleration' revealed that many of the users have limited information technology (IT) skills, and as a result, many perceive computers as irrelevant to their professional training. Khudair and Cooke reiterate that knowledge diffusion to health care professionals has been inhibited by the difficulty of accessing up-to-date information, ignorance of the availability of information, and poorly organised information. Watts and Ibegbulam (2006) strongly believe that it is because of all this that health care professionals continue to face the daunting task of remaining fully informed of advances in their discipline.

Finding answers to questions about practising medical doctors' information-seeking behaviour is by no means straightforward. Doctors' recognition of

deficiencies in their knowledge, as well as the vigour with which they attempt to eliminate the deficiencies, has a relationship with the socioeconomic contexts in which they work and with the information-seeking strategies and information sources that they employ.

This study did not only seek to identity what information practising medical doctors at Katutura and Windhoek Central State hospitals seek but also why, when, and where they look for information.

1.3 Research problem

Health care services occupy an important and significant position among the decisions made by the Namibian Government. Health authorities are seeking an ideal way to exploit and manage the patients' medical data to assist health care providers in improving the quality of health care in Namibia. One of the developments is the creation of a Hospital Management Information System, which is still under consideration.

Medical doctors working in state hospitals are a central part of the Namibian health delivery system. Their information needs (INs) and information-seeking behaviour (ISB) are critical in improving the current state of health information services provision. Medical doctors are trained at different medical schools and serve in hospitals that vary socially, economically, and politically, thus, their ISB could be affected by their different contexts (Ronald & Wicks, 2009). A well-informed medical doctor will save time with patients as well as deliver better quality service. Therefore, it is necessary to know how well equipped and informed doctors are to deal with different medical situations in order to provide

better information services to this category of information users as well as contribute meaningful empirical data to the Hospital Management Information System.

Different researchers have given conflicting information as far as the ISB of practising medical doctors is concerned. Khudair and Cooke (2008) and Jacko et al. (2001) have pointed out that health personnel are enthusiastic about using the Internet because it reduces isolation and facilitates international cooperation. However, Khalid (2000) argues that health personnel perceive computers as irrelevant to their profession. To this effect, Watts and Ibegbulam (2006) reiterate that this is why health care professionals continue to face a daunting challenge when it comes to searching for information and remain uninformed about the advances in their discipline.

This study should contribute to the Namibian Government's attempts to improve the situation. Understanding users' information needs and the way information is disseminated through an organisation is needed in creating a fruitful system and providing quality services. Therefore, studying the information needs and information-seeking behaviour of doctors in different settings is a key step in finding out doctors' perceptions of their need for information for good medical decision-making and developing a successful information provision system that would help them in their practice.

1.4 Research aim, objectives, and questions

The study was guided by the research aim, objectives, and questions as outlined below.

1.4.1   Research aim

This study aimed to find out the information needs and the information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals in order to address their medical information needs.

1.4.2   Research objectives

The study was guided by the following research objectives:

1) To identify the information needs of practising medical doctors at Katutura and Windhoek Central state hospitals;

2) To find out how practising medical doctors at Katutura and Windhoek Central state hospitals seek information;

3) To identify the information sources used by practising medical doctors at Katutura and Windhoek Central state hospitals;

4) To identify factors affecting practising medical doctors at Katutura and Windhoek Central state hospitals in accessing and acquiring information for their medical practice;

5) To find out how health information service provision may be improved; and

6) To develop conceptual models of information seeking for medical doctors at Katutura and Windhoek Central state hospitals.

1.4.3   Research questions

Based on the above-mentioned objectives, the following research questions and themes guided the study:

Table 1.1: Research questions and related themes

Research question	Theme
What are the information needs of practising medical doctors at Katutura and Windhoek Central state hospitals?	Information needs
How do practising medical doctors at Katutura and Windhoek Central state hospitals go about seeking information?	Information behaviour
What kind of information sources do practising medical doctors at Katutura and Windhoek Central state hospitals consult when seeking information?	Information sources
What factors, if any, affect practising medical doctors at Katutura and Windhoek Central state hospitals when looking for the information they need?	Factors affecting information seeking
How may health information services for Namibian practising medical doctors be improved?	Information service provision

1.5   Definition of terms

Different terms are associated with user studies, such as information, information need, information seeking, information-seeking behaviour and decision-making. These terms are defined differently by different scholars. The different definitions of some terms have raised some uncertainty in user studies. To avoid confusion, it is important to define the terms as they are used in this study:

Information

In this study, the terms 'data', 'information', and 'knowledge' are used synonymously, because they are not clearly delineated in studies of information behaviour.
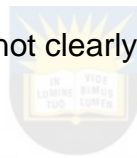
Information need

Information need is a gap in a person's knowledge that, when experienced at the conscious level as a question, gives rise to a search for an answer.

Information seeking

Information seeking is an information behaviour that includes the purposive seeking of information in relation to one's problems. Sometimes people seek information simply out of the desire to have more information.

Information behaviour

Information behaviour includes information seeking as well as the totality of other unintentional as well as purposive behaviours that do not involve seeking, such as actively avoiding information.

Doctor

In this study, a doctor is a person who is qualified to practice medicine. This study focused on doctors working at secondary and tertiary levels. Some of these doctors specialise in different areas of medicine or surgery, such as anaesthetics, cardiology, ophthalmology, paediatrics, pathology, etc.

Hospital

A place where medical treatment, surgical treatment and nursing care of the sick are provided.

Clinical contexts

These are different situations within which doctors treat patients, such as outpatient departments, wards, and casualty/emergency rooms.

Health information

Data, processes, or knowledge (communicated by humans or artificial intelligent systems) used by practising medical doctors to make medical decisions.

Medical practice

Doctors practice their profession through activities such as clinical decision-making, attending meetings, and providing consultations.

Clinical decision-making

Doctors make clinical judgments on specific aspects of care such as diagnosis, choice of tests, prescriptions, surgery, and therapy.

1.6 Research method

A mixed-methods research approach (employing both quantitative and qualitative techniques) was used because of its ability to gather data on attitudes and behaviours as well as to find answers to the questions of 'who?', 'what?', 'when?', and 'where?' The study was conducted at Katutura and Windhoek Central state hospitals.

1.7 Study population

The population for this study were the 140 (about 60 at Katutura and 80 at Windhoek Central) medical doctors practising at Katutura and Windhoek Central state hospitals.

1.8 Sampling procedure and sample size

All 140 medical doctors at the two hospitals became the sample of the study in terms of the total enumeration sampling strategy.

1.9 Research techniques used

Data were gathered using the methods described below.

1.9.1 Self-administered questionnaires

For quantitative data, a questionnaire with open-ended and closed questions based on the concepts of Wilson's information-seeking behaviour model was

used to collect data on context, information behaviour, and challenges faced in seeking information (see Appendix 6).

Likert scales are a widely used attitude-scaling tool and in this study, a four-point scale was used. The scale measures the extent to which a person agrees or disagrees with the question; for example 'strongly agree', 'agree', 'disagree', or 'strongly disagree' (Albaum, 1997). The scale was used to collect information on demography, information needs, information behaviour, factors affecting information seeking, and ways to improve information services. To complement questionnaire data, semi-structured interviews were conducted.

1.9.2 Semi-structured interviews

Interviews are a direct face-to-face attempt to obtain reliable and valid measures in the form of verbal responses from respondents. Interviews were used to obtain qualitative data on personal information, attitudes, perceptions, and beliefs of medical doctors with regard to their information needs, information-seeking behaviour, and the factors associated with these needs and behaviours (see Appendix 7).

1.10 Validity and reliability

Triangulation (using different data gathering instruments) was employed to give the desired confidence, or what Struwig and Stead (2001) refer to as reliability and validity, to the study.

In addition, in order to test the validity of the research instruments, a pilot study was carried out before the final survey commenced. The testing of the research

instruments is an important step in carrying out a study in order to identify deficiencies in the questionnaire and the interview guide and get ideas for improving them. This, according to Smith (2008) provides greater validity to the research instrument.

A sample of five medical doctors from Engela Hospital in Ohangwena Region was used. The final comments received from the pilot study were used to re-word the final data collection instruments.

1.11 Data analysis

A computer-based programme, IBM SPSS (Version 25) was used to organise and analyse statistical data obtained using quantitative techniques. Qualitative data obtained through verbal (interviews) and written responses were analysed using content analysis.

1.12 Significance of the study

The findings of this study are significant in several ways. First, they lead to a better understanding of the information needs of practising medical doctors by identifying existing gaps in information services. Second, the findings can influence policy and decision makers in improving health information provision. Third, the findings contribute to academic knowledge on the subject of information needs and information-seeking behaviour of practising medical doctors. Finally, the new proposed models based on literature and the study's findings contribute to the models of information needs and information-seeking behaviour, focusing on practising medical doctors.

1.13 Ethical considerations

Research ethics provide the researcher with a code of moral guidelines on how to conduct research in a morally acceptable way. It involves getting the informed consent of those the researcher is going to interview or question. It also involves reaching an agreement about the use of these data, and how their analysis is to be reported and disseminated (Gillespie, 2008). Before the study commenced, this researcher applied for a research ethical clearance certificate from the University of Fort Hare (Appendix 1). Permission was also sought from the Ministry of Health and Social Services in Namibia (Appendix 2) and from the superintendents of the two hospitals concerned (Appendices 3 & 4). Informed consent was sought from the participants (Appendix 5), and confidentiality was protected by way of not requiring participants to give their names.

1.14 Delimitations of the study

This study investigated the information needs (INs) and information-seeking behaviour (ISB) of practising medical doctors at Katutura and Windhoek Central state hospitals only. It also investigated INs and ISB of practising medical doctors, and excluded other health service providers such as nurses and allied health professionals. The researcher withdrew medical students from the study because the focus of the study was on practising medical doctors.

It should also be noted that the purpose of the study was not to compare the two participating hospitals, but to focus on the information needs of practising medical doctors in the two major hospitals in Namibia.

1.15 Conclusion

This chapter has provided an overview of the study by discussing the orientation of the study, statement of the problem, objectives of the study, significance of the study, ethical issues, definition of terms, research methodology and limitations of the study. The next chapter reviews the literature on INs and ISB of practising medical doctors, information sources used by practising medical doctors and factors affecting their ISB.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This literature review was undertaken based on the notion that knowledge accumulates and that we learn from and build on what others have done (Neuman, 2011, p. 111). In an attempt to locate literature on the information needs and information-seeking behaviour of practising medical doctors, the researcher consulted a number of databases, including Academic Search Premier, Regional Business News, Business Source Premier, Education Research Complete, Education Resource Information Center, Library Information Science & Technology Abstracts with Full Text, MasterFILE Premier, eBook Collection (EBSCOhost) and eBook Academic Collection (EBSCOhost). While no studies were found on the information needs and information-seeking behaviour of practising medical doctors in Namibia, a few were found on different information user groups. The researcher expanded the search to include the continent of Africa.

Information is declared by UNESCO (2017) to be a basic human right just like water, food, and shelter. It is an important component for the socio-economic and healthy development of any nation. The national developmental plan of the Namibian government promises quality and accessible public health services for all the citizens by the year 2030 (Republic of Namibia, 2004). However, this dream is far from reality. Although a lot is being done to prevent diseases and extend the life of people, Namibia is faced with continued health threats ranging from malaria, cholera, diarrhoea, malnutrition, high levels of infant and maternal

mortality, low levels of life expectancy, and deteriorating health care facilities (World Health Organization, 2006).

Access to and use of reliable medical information by practising medical doctors in Namibia is of great importance if they are to provide quality health services to the citizens. Although practising medical doctors in Namibia may be aware of many different diseases that they encounter during their clinical practices, they may not have adequate knowledge on how to treat all the diseases they come across. Medical information is growing at an overwhelming rate with the invention of new drugs, new diagnostic techniques, and treatment being introduced. Therefore, information providers need to know the information needs and information-seeking behaviour of today's doctors so that relevant up-to-date information seeking models or information services can be developed.

Several studies on the information needs and information-seeking behaviour of practising medical doctors have been conducted in developed countries. However, literature from developing countries is scarce. In Namibia, a medical practitioner is guilty of misconduct, if he/she participates in a discussion of health issues without possessing the necessary knowledge and skill in respect of the field of medicine to which the discussion relates (Ministry of Health and Social Services, 2002). Knowing the information needs and the information-seeking behaviour of practising medical doctors and their use of information channels, information sources, and ICTs would inform future efforts that support doctors in their day-to-day care of patients.

Searches for grey literature on the topic area were conducted using the Google search engine. Articles for the literature review were drawn from peer-reviewed journals, conference papers, consumer studies, health professional studies, research by recognised independent institutions, as well as systematic and narrative reviews of the various topics. The two studies that were used as key literature sources for this study (Al-Dousari, 2009 & Tunde, 2016) used Wilson's model as their theoretical framework, which was also used in this study.

Below are some of the studies conducted internationally, continentally, and in Namibia as they relate to the topic under study.

2.2 Existing international literature on information needs and information-seeking behaviour of medical doctors

As far as the field of information needs and information-seeking behaviour are concerned, a large number of studies have been conducted globally and the literature is growing rapidly. The researcher expanded the literature search to include the developed world to obtain a general overview of the information needs and information-seeking behaviour of practising medical doctors elsewhere. However, Kale (1994) has this to say about too much irrelevant information in the developed world that is being transferred to the developing world:

> The position in the developed world is quite the reverse. Most doctors are deluged every week with so much information that they are virtually paralysed by its plethora. Too much irrelevant information is also unhelpful. Transferring all available information

from the developed countries to the developing ones is obviously

not going to meet the health information needs of the developing

world (p. 940).

It is for this reason that conducting a study on information needs and information-seeking behaviour of practising medical doctors in Namibia is regarded as necessary rather than just taking information from developed countries and assuming that it will work for Namibia. However, the researcher is convinced that, in the light of globalisation, international studies have a significant bearing on Namibia.

In the United Kingdom (UK), Bryant (2004) conducted a case study on the information needs and information-seeking behaviour of family doctors and incorporated both quantitative and qualitative research methodologies. The results revealed that family doctors are prompted to seek information by needs arising from a combination of professional responsibilities and personal characteristics. A need for problem-orientated information, related to the care of individual patients, was the predominant factor that prompted these general practitioners to seek information. Personal collections remain the preferred information resource, while electronic sources ranked second. There was low usage of the medical library. However, both vocational training and the employment of a practice librarian affected library use. Although Bryant's study was specifically on family doctors, its results are of interest to this current study in a number of ways. Bryant's focus was on medical doctors and it sought to

identify their information needs and information-seeking behaviour, which is what the current study sought to do in the Namibian context.

Callen, Buyankhishiq, and McIntosh (2008) used self-administered questionnaires to conduct a study on clinical information sources that are used by hospital doctors in Mongolia. The respondents indicated that discussion with colleagues was the most frequently used information source, foreign medical textbooks most commonly inspired high confidence, and discussion with colleagues was the source most often perceived as having a high impact on clinical decision-making.

Hughes, Wareham, and Joshi (2010) also conducted an online study with English doctors on 'Doctors' Online Information needs, cognitive search strategies, and judgments of information quality and cognitive authority'. Diaries consisting of 444 real clinical information search incidents, combined with semi-structured interviews were used. Results showed that doctors, though aware of the need for information quality and cognitive authority, rarely make evaluative judgments. This is explained by navigational bias in information searches and via predictive judgments that favour known sites where doctors perceive levels of information quality and cognitive authority. This behaviour is in line with Ronald and Wicks (1999, p. 209) who hypothesised that the information-seeking behaviour of a people is influenced by the 'role they are playing at a particular time'. The pattern of information-seeking behaviour can be 'open' or 'closed'. An open information-seeking behaviour is one in which an individual is not restricted to consult from a certain source, while a closed information-seeking behaviour

is one in which individuals are restricted to consult from known information sources. A study by Clarke, Belden, Koopman, Steege, Moore, Canfield, and Kim (2013) also revealed that accessibility, timeliness and urgency are some of the factors that cause doctors to seek information from known sources.

In New Zealand, Cullen, Clark, and Esson (2011) conducted a study on evidence-based information-seeking skills of junior doctors entering the workforce, using participants drawn from different training cohorts. Participants were interviewed about their recall of the instruction they had received, and their confidence in retrieving and evaluating information for clinical decision-making. They completed a search based on a scenario related to their specialty. Their self-assessment of their competency in conducting and evaluating a search was compared with an evaluation of their skills by an experienced observer. Results of this study show that most participants recalled the training they received but had not retained high-level search skills, and lacked skills in identifying and applying best evidence. The researchers concluded that commitment to evidence-based medicine from clinicians at all levels in the profession is needed to increase the information seeking skills of clinicians entering the work force. Ramos, Linscheid, and Schafer (2003) conducted a similar study in California, USA, and discovered that physicians have clinical questions but rarely use evidence-based sources to answer them. Instead, they prefer information sources that are accessible and known to them.

Flynn and McGuinness (2010) used a survey to conduct a study in Ireland on hospital clinicians' information behaviour and attitudes towards what they

referred to as the 'clinical informationist'. Results of this study showed that clinicians experience diverse information needs for patient care, and that barriers such as time constraints and insufficient access to resources hinder their information seeking. Findings also showed that clinicians struggle to fit information seeking into their working day, regularly seeking to answer patient-related queries outside of working hours. These findings concur with those of Green and Ruff (2005) which revealed that time constraints was another barrier to searching online resources by medical professionals.

In India, Vali, and Esmail (2014) used questionnaires in their study on information needs and information-seeking behaviour of faculty in government medical colleges of Karnataka. The study revealed that doctors are highly dependent on evidence based regularly updated textbooks. The least required documentary source in this study was drug advertisement literature. Borrowing of books was ranked first in terms of using the institutional library, which shows that the respondents made extensive use of the library to borrow books. Although this study was on information-seeking behaviour of faculty in government medical colleges, the use of books also applies to the current study.

AI-Dousari (2009) used a mixed methods approach to conduct an exploratory study on information needs and information-seeking behaviour of doctors in Kuwait's government hospitals. The results showed that the most frequent need for information was to keep up-to-date to maintain good medical practice. It was found that interpersonal communication and a doctor's personal collection, consisting primarily of electronic resources, were the sources most frequently

used by the doctors. The study revealed that the degree of use of clinical information sources varied depending on the clinical scenario. Doctors' knowledge and patient data were the doctors' most frequently used sources of information in the three clinical scenarios: outpatients, wards, and the emergency department. There was low use of knowledge-support resources such as the Internet and library resources in the outpatient ward and emergency rooms. However, use of the knowledge-support resources was highest in the wards. Al-Dousari's study was of much interest to the researcher as it was a helpful source in designing the questionnaire for this study because of its closeness to the nature of this study. In addition, some findings in Al-Dousari's thesis helped this researcher in the designing of the three models for practising medical doctors (see Chapter 9). Al-Dousari's (2009) study was therefore a key literature source for this study.

Clarke et al. (2013) did an international literature review on the information needs and information-seeking behaviour analysis of primary care physicians and nurses. The review was done through a comprehensive search in PubMed, CINAHL, SCOPUS, as well as an examination of references from relevant papers and hand-searched articles to identify applicable articles. It should be noted that contrary to the current study, Clarke et al.'s study excluded studies that focused on specialists and paediatricians, whose needs the authors found to be more customised than those of general practitioners (Clarke et al., 2013, p. 183). Results from the reviewed papers showed that the most common information needs found among physicians and nurses were related to

diagnoses, drugs and treatment. Colleagues remain a preferred information source among physicians and nurses; however, a rise in Internet usage is apparent. Another literature review in the UK by Davies (2007) revealed that the top categories of information needs are treatment or therapy, diagnosis and drug therapy.

González-González, Dawes, Sánchez-Mateos, Riesgo-Fuertes, Escortell-Mayor, Sanz-Cuesta, and Hernández-Fernández (2007) conducted an observational study on the information needs and information-seeking behaviour of primary care physicians in Madrid, Spain. Results showed that the most frequent clinical questions were related to diagnosis and treatment. The most frequent generic type of question was 'What is the cause of symptom x?' These results concur with those of two literature reviews by Clarke et al. (2013) and Davies (2007), which revealed that physicians needed information for diagnosis and treatment of patients. The time taken and the success rate in finding an answer during a consultation and afterwards were two minutes and thirty-two minutes, respectively. These results are similar to those of a study by Ramos, Linscheid, and Schafer (2003), which revealed that physicians took less than two minutes to search for answers to clinical questions. The current study looks into factors affecting doctors' information-seeking behaviour.

Prakasan (2013) reviewed international studies on the information needs and information use by healthcare professionals. The focus was on different types of professionals in the medical field such as medical faculty members, general practitioners, nursing professionals, family physicians, clinicians, etc. The review

showed that health-care professionals need up-to-date information to serve society better.

Ayatollahi, Bath, and Goodacre (2013) conducted a study on the information needs of clinicians and non-clinicians in the emergency department in Northern England. In this study, a qualitative approach was used to gain an in-depth understanding of the emergency department staff's information needs and the sources of information that they used. Results showed that different types of information needs and sources of information were needed. Patient information was considered the most important type of information, and verbal communication was the most frequently used source of information.

Umesha and Chandrashekara (2013) conducted a survey on the information seeking and searching behaviour of dental science professionals in Karnataka, India. Among the respondents, 97.40% indicated that they had access to Internet, and 91% indicated that they used the Internet on a regular basis. Lack of training and information overload were indicated as some of the factors affecting Internet usage. Umesha and Chandrashekara (2013) proposed that there is a need for a well planned Internet literacy programme and preparation of subject gateways to meet the needs of dental professionals. The study found that the majority of the dental colleges in Karnataka are equipped with a good number of computer terminals and good Internet bandwidth, but information resources are more in traditional print media. The study also found a miss-match between users' attitude and the collection in the libraries in Karnataka, although they have good information technology infrastructure. This shows that access is

not just about having the resources. Even if doctors have access to computers and Internet, it remains a big challenge if they do not have the necessary skills to find the appropriate information needed to do their work.

Singh (2012) conducted a case study in India on the information-seeking behaviour of medical practitioners using a survey method to provide descriptive data concerning the use of various sources of information in Medical Sciences. Most of the medical practitioners in this study were in unison in their preference for journals, Internet resources, and services as the most important sources of information for their teaching and research purposes. The study indicates that medical practitioners are diversified in the information they seek, the sources they access, and the use they make of the information. However, the scientific journals have been ranked highest as a source for obtaining specific information and keeping up-to-date information, while it has been ranked second with regard to acquiring background information.

Gavino, Ho, Wee, Marcelo, and Fontelo's (2013) study on the information-seeking trends of medical professionals and students from middle-income countries, with a focus on the Philippines, revealed that 88% of the participants encountered at least one clinical question daily, while 58% were very likely to search for answers. A basic mobile phone was the most used device at home (94%) and at work (82%). More than half (62%) had Internet connectivity at home and just below half had Internet connectivity at work (46%). In decreasing order, short messaging services, email, instant messaging, and multimedia

messaging services were the most commonly used messaging tools at home and at work.

Younger (2010) conducted a short international review on Internet-based information-seeking behaviour among doctors and nurses. Literature search was carried out on PubMed and CINAHL to identify existing reviews of the subject area and relevant original research between 1995 and 2009. Further searches were carried out on Embase (Ovid), LISA, and LISTA. Results were that there appear to be no significant differences between the reasons doctors and nurses seek online Internet-based evidence, or the ways in which they locate that evidence. Reasons for searching for information online are broadly the same, i.e. primarily, patient care and continuing professional development. The perceived barriers to accessing online information are the same in both groups. There is a lack of awareness of the library as a potential online information enabler. The results of Younger's (2010) review are similar to those of Clarke et al.'s (2013) review, which revealed that the reasons that physicians and nurses look for information are the same. However, the current study did not make any comparison between doctors and other medical professionals' information-seeking behaviour.

Smith, van Velthoven, Truong, Nam, Anh, AL-Ahdal, Hassan, Kouzl, Huy, Brewster, and Pakenham-Walsh (2020) conducted a systematic review on how primary healthcare workers obtain information during consultations in low-income and lower middle-income countries. The results indicated that internet-based sources appeared to be useful when it is possible to download content for

offline use and to update when there is internet access. This highlights the trend of Internet use, ICTs and keeping up-to-date in medical settings. This shows the importance of Internet access in low and middle-income countries, such as Namibia.

Formosa, Rizzini, Bassi, Bonfanti, Rizzardini, Campomori, and Mosconi's (2016) quantitative and qualitative study conducted in Italy, which sought to establish the kinds of drug information that specialist doctors would need to support their clinical practice, was aimed at investigating features of scientific information that doctors receive and their ratings about its completeness, quality, and usability. The quantitative survey indicated doctors' appreciation of traditional channels (especially drug representatives) and information materials (brochures), but also their attitude towards autonomous search for information and their wish to have more digital channels availed. Focus groups provided more depth and, not surprisingly, revealed that physicians consider it critical to get complete, comparative, and specific information quickly, and that they would like to discuss their doubts with expert colleagues. Quite strikingly, limited concerns were expressed on information validity, potential biases, and conflicts of interest, as scientific validity seems to be related to the perceived authoritativeness of information sources rather than to the availability of a transparent evaluation framework. Although Formoso et al.'s (2016) study investigated views of infectious disease specialists, the researcher believes that their opinions and perceived needs should not differ substantially from those of other clinicians, either in primary or in secondary care.

Nylenna and Aasland (2000) conducted a survey in Norway on the information-seeking behaviour of primary care physicians. Results showed that two out of three doctors thought they could cope with the increasing flow of medical information. Courses, meetings, and congresses were considered the most important clinical medical education activities. Primary care physicians spent less than three hours per week on medical reading, compared to more than four-and-half hours spent by hospital doctors. In addition, 59% of primary care physicians had access to the Internet, compared to 76% of hospital doctors. Time spent on medical reading and formalised courses decreased from 1993 to 1999 for all groups of physicians. This confirms that one's context plays a major role in information seeking, in agreement with Wilson's assertion that the rise of an information need is influenced by the context (see Section 3.5 in this thesis).

Davies (2007) reviewed available literature in the United Kingdom from 1996 to 2006, focusing on the information-seeking behaviour of doctors. The review considered three sub-themes, namely, the information needs of doctors, information seeking by doctors, and information sources utilised by doctors. The review is wide ranging. It shows that the traditional methods of face-to-face communication and use of hard-copy evidence still prevail amongst qualified medical staff in the clinical setting.

Naeem, Ahmed, and Khan's (2013) study on information seeking in primary care surveyed doctors working in remote government health facilities in Pakistan. A closed-ended questionnaire was developed after relevant literature review and an assessment of the situation of the remote government health facilities in the

Multan district. Results of this study showed that doctors rarely had access to the services of medical librarians and medical libraries. About 74% of the respondents had no access to a computer with Internet access, which could explain the finding that the print format is the most preferred format for seeking clinical information among primary care doctors. Naeem et al.'s study concluded that doctors' information seeking encountered barriers such as non-availability of medical librarians and medical libraries.

Brennan, Edwards, Kelly, Miller, Harrower, and Mattick's (2014) study on qualified doctors and medical students' use of resources for accessing information was conducted using a stratified sample of 46 participants recruited in Devon, UK. Participants kept a self-report diary of resources used over a week. The diaries were then used to stimulate recall within a semi-structured interview. Results show that participants used many resources, but typically for a short duration. Results also revealed that the categories of reasons for accessing the resources were 'to check', 'to learn', and 'to demonstrate'. The two main factors influencing the choice of information resource were 'ease of access' and 'quality of information'. Students accessed more information, for a longer duration. While Brennan et al.'s (2014) study included the information needs and information-seeking behaviour of qualified doctors and medical students, the current study considered only practising medical doctors. This was done because, as shown in Brennan et al.'s study, factors affecting qualified doctors and those factors affecting students are different.

Mendes, Abreu, Vilar-Correia, and Borlido-Santo (2017) conducted a study in Portugal, in which they explored the health information-seeking practices of healthy young adults and how they assess and rank sources of information through a qualitative study. The findings show that participants were strongly committed to searching for information about health and lifestyle through the Internet. Healthcare professionals were considered the most reliable source of health information. Online health information, although frequently accessed and experienced as empowering, was seen as a potentially unreliable source. Mendes et al. (2017) concluded that participants' trust towards professionals suggests their preference and need for more personalised care, and that it is a response to the ambiguity and uncertainty that permeates the health information landscape, particularly that which is web-based.

Lee (2013) conducted a study on the information needs of clinicians. External consultants were hired to conduct interviews and a survey among the membership and to perform an environmental scan of Canadian and United States services. Several interviews were conducted by the health librarian at health libraries in the United Kingdom. Results showed that 63% of the survey respondents said they accessed information to help inform patient diagnosis or treatment at least every 23 days, 40% of the respondents regularly used web-based medical information services, and 46% used the Clinical Library (CL) as part of their electronic search strategy. The use of the CL varied widely depending on the location of respondents and their access to a health library.

Family practitioners showed the most familiarity with the CL offerings and reported the highest use of the CL (66.7% of respondents).

Ramos, Linscheid, and Schafer (2003) used direct observation to determine the extent to which physicians spend time searching for evidence-based answers. The setting was the University of California San Francisco-Fresno Family Practice Residency Program. Results showed that participants asked 274 clinical questions over 215 patient encounters. The group sought immediate answers to 66% of the questions, found satisfactory answers to 87% of these, and later pursued answers to only 6% of the remaining questions. Most searches (66%) took less than two minutes. Physicians most commonly used another person or a pocket reference. The researchers concluded that residency physicians have clinical questions but rarely use evidence-based sources to answer them.

Results from the review show that practising medical doctors need information for keeping up-to-date and improving their knowledge. Results from the reviewed articles indicate that personal collections (textbooks, reference books, pocket books, handouts from conferences, DVDs) and the Internet are the preferred information sources.

As can be seen from the literature cited above, there is a vast array of studies on information needs and information behaviour in health related contexts. However, the geographical contexts, institutional contexts, target populations, research focus, and methodologies vary widely. Some of the results of these different studies are similar, while, others are different. This current study helps

to narrow the gap as it focuses specifically on the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals, using the mixed-methods approach. The results of this current study can help information service providers and beyond to strengthen their service to practising medical doctors, thereby contributing to better health provision to society.

2.3 Existing literature on information needs and information-seeking behaviour of medical doctors in Africa

While it is helpful to learn from international literature, it is important to know what is happening on the African continent. It is for this reason that this subsection reviews literature on information needs and information-seeking behaviour of practising medical doctors in Africa.

Andualem, Kebede, and Kumie (2013) carried out a study on the 'Information needs and seeking behaviour among health professionals working at public hospitals and health centres in Bahir Dar, Ethiopia'. Andualem et al. employed an institution-based cross sectional study using quantitative and qualitative methods. The results of the study showed that the majority of the participants needed information to update knowledge. The study also revealed that the majority of the participants preferred using formal health information resources such as textbooks and protocol manuals, compared to informal ones, such as colleagues. The study revealed that participants sought health information resources mainly because of self-initiated information needs and questions from patients. The study further revealed that less than half of the respondents had

access to the Internet, which they accessed at their working area. The reasons for using the Internet included e-mail, searching for drug and patient care information, and checking new findings. The most frequently used Internet search engine was Google. Andualem et al.'s study is closely related to the current study in that its population was health professionals practising in health institutions – although Andualem et al.'s study might have included health professionals other than medical doctors. In addition, the findings of the study answer some of the research questions raised in the current study, for example, questions on the sources used, reasons for seeking information, and access to information. However, Andualem et al.'s study was mainly qualitative, while this current study sought to strengthen the findings through triangulation, using a mixed-methods approach.

Arraid (2011) studied the 'Information needs and information-seeking behaviour of Libyan doctors working in Libyan hospitals'. The researcher employed a multi-method approach. The purpose of using a multi-method approach was to increase the understanding gained from the quantitative data by obtaining more in-depth information from qualitative data and to integrate the advantages of both methods. Arraid's (2011) study found that patient data, disease information, drug information, and medical images were some of the main types of doctors' information needs. The study also found that the main contexts that gave rise to doctors' information needs were education and clinical practice. Ambiguity, uncertainty, rare diseases and the multiplicity of options were the motivations for information needs. The acquired information was used for keeping up-to-date,

answering colleagues/patients' questions, and writing research papers. Personal libraries and human sources were the most heavily used channels to access information. Books rather than journals were indicated as the top information source. Unsurprisingly, about a quarter of urban doctors and almost half of rural doctors ranked online databases as the last source to be consulted. This could be an indication of the challenges related to Internet access in rural settings. The majority of doctors indicated difficulties in obtaining electronic information, particularly from online databases. Moreover, the majority reported that sometimes they needed a mediator to perform searches on their behalf. Availability, ease of access and use, integration in the work environment, and information skills were the main types of barriers to using information sources, particularly electronic sources. Arraid's study is one of the very few studies conducted on the African continent that are very similar to this current research. The topic, the methodology, the reason for using the methodology and the areas of enquiry are almost the same as those for this current study, e.g. types information needs; the main contexts that gave rise to doctors' information needs; the motivations for information needs; reasons for seeking information; channels of accessing information; types of sources consulted; availability, ease of access to information; and barriers to information seeking. The main difference between Arraid's study and this current study is the geographical location. Libya is in the far north of Africa, north of the Sahara, while Namibia is a sub-Saharan country in the southwestern part of Africa. The results of Arraid's study are therefore very relevant in comparing them with the results of this

current Namibian study. Such a comparison might help in either generalising research results or being cautious due to geographical differences.

A number of studies related to the topic under study have been conducted in Nigeria. One of the studies was carried out by Tunde (2016), who sought to ascertain the information behaviour of medical faculty in the tertiary health institutions in Kwara State, Nigeria. Like Norbet and Lwoga (2012), Tunde also based the study on Wilson's (1994) model of information behaviour. Tunde used the post-positivist research paradigm as the theoretical lens to illuminate the research problem. A combination of quantitative and qualitative methods was used as the study design. The results showed that the majority of the participants either sought information from senior colleagues or received information through faculty board and departmental meetings. The study also found that a significant number of the participating health faculty spent the majority of their time seeking information. Most of the respondents (63.6%) indicated that they used books as their most sought after information source from the library and that the faculty mostly used library catalogues to access information. Institutional libraries were a key factor in accessing information, as 53.1% indicated that they used their respective institutional library to access information. A very high number of the respondents (88.9%) said that they used the Internet for accessing information. This indicates that the participants had considerable access to institutional libraries and the Internet. However, although there was access, only a few visited the library to seek information. More than half of the participants (55.8%) asked for second opinions from their colleagues. Tunde's (2016) study revealed some

factors affecting information behaviour, which included inadequate resources, lack of qualified staff, limited funding, high cost of journal subscriptions, limited library space and limited opening hours of the library. Although Tunde's study was conducted on academic personnel (medical faculty in the tertiary health institutions), the medical setting is important. However, caution should be taken when making comparisons with Tunde's research, as the participants did not deal with patients and the study might have included non-medical faculty in the health institutions.

Another Nigerian study was conducted by Nwafor-Orizu and Onwudinjo (2015) to ascertain the availability and use of health information resources by doctors in teaching hospitals in South East Nigeria using a descriptive survey design. The results showed that health information resources are moderately available to doctors and that they use them for different purposes. This study is almost similar to the one that was carried out by Tunde (2016), as it focused on teaching hospitals. The relevance of Nwafor-Orizu and Onwudinjo's (2015) study to this current study lies in the fact that it was related to information availability in a medical setting. The findings on the availability of health information to doctors may be an indication of the reality on the African continent with regard to access to information in general.

Nyam, Akawe, and Tyonum (2015) also conducted a study on information needs and information-seeking behaviour of medical students at Benue State University, Makurdi. The design adopted for this study was descriptive survey. The study found that medical students need information to update their lecture

notes, to know job opportunities that exist for medical graduates, for entertainment, and to get information for their final year project. The information sources used included fellow students, bibliographies compiled by the medical library, consulting knowledgeable persons in the field, abstracting journals and indexing journals, Internet, radio and television, library catalogues, medical textbooks, and discussions with librarians. The students used the Internet for news updates, medical information, education, and entertainment (chatting with friends). The factors affecting the students included inadequate tables and seats for reading, outdated information materials, noise from fellow students, unavailability of up-to-date sources, not knowing how to use the library catalogue and lack of knowledge in using library facilities. While Nyam et al.'s study was related to information needs and information seeking behaviour of people in the medical field, this study focused on students, who were excluded in this current study as it was concerned with practising medical doctors. Also, the setting (a university) was different from that of the current study, which was a hospital setting. This source helps to show that the needs of practising medical doctors are fundamentally different from the needs of students, hence the exclusion of students in this current study.

Another study was conducted by Nwezeh, Shabi, and Shabi (2011) on the information-seeking behaviour of doctors at the Obafemi Awolowo University teaching hospitals complex at Ile Ife in the Osun State of Nigeria, using a descriptive, multi-methods, cross-sectional survey, which involved the use of self-administered questionnaires, interviews, and on-the-spot observation

during consultation. The study found that information needs were not being met by the university library services. The researchers recommended computerisation of library services, interlibrary connection, current awareness services, and improvement in the interpersonal relationships of library staff as a means to improve library service. Although this study focused on medical doctors, the main job of the doctors was teaching at the university and the setting was an academic setting rather than a hospital setting. Nwezeh et al.'s methodology is however similar to this current study as it used triangulation, although this study did not employ observation. This researcher found the questionnaire and the follow up interviews to be sufficient in achieving the objectives of the study.

Abbas, Abubakar, Omeiza, and Minoza (2013) conducted a study on 100 participants on the information-seeking behaviour and computer literacy among resident doctors in Maiduguri, Nigeria. A pre-tested self-administered questionnaire was used. The results revealed that 73% of the respondents used printed material as their main source of medical information. Ninety-three percent owned a laptop, a desktop, or both, while 7% had no computers. Ninety-four percent of the respondents were computer literate, while 6% were computer illiterate. Seventy-five percent had an e-mail address, compared to 25% who did not have. Seventy-five percent searched the Internet for information, while 25% did not know how to use the Internet. Abbas et al. concluded that despite the high level of computer ownership and high literacy rate among the participating resident doctors, printed materials remained their main source of medical

information. Abbas et al.'s study focused on information technology and how doctors use it in information seeking. Although information technology is only one component of this current study, the findings in Abbas et al.'s study add value to this current study, especially with regard to the use of ICT, access to information, and barriers to information seeking.

Nel and Fourie (2010) explored the information behaviour of veterinary practitioners in South Africa using a self-administered questionnaire (closed and open-ended questions). Their study found that the veterinary practitioners used information for keeping up-to-date with new developments in the field for continuous professional development (CPD); emergency problem solving; doing their work better; papers/presentations delivered at conferences; buying new products, equipment or technology; work-related projects; studying; and for use in the professional groups in which they participated. The study also found that the veterinary practitioners preferred journal articles, textbooks, and the Internet as sources of information. Notably, the library was least preferred. In emergency situations, the participants mainly consulted textbooks, colleagues, the Internet, and lastly the library. Although this study was on animal doctors, the study is relevant as it involved medical practitioners, which this current study also focused on. The difference is in their target of service. For example, in studies where humans are the target, the patients have been found to be valuable sources of information to the medical practitioners. The behaviour of the veterinary practitioners in Nel and Fourie's study therefore is of value to the

ongoing research on medical practitioners' information needs and information-seeking behaviour.

Cline and Luiz (2013) conducted a South African case study on information technology systems in public sector health facilities in developing countries. They used a mixed-methods approach (quantitative/qualitative) involving structured interviews with nursing staff, doctors, and hospital administrators. The results of their study showed that the impact of automation in terms of cost and strategic value in public sector hospitals yielded positive outcomes with regard to patient experience, hospital staff workflow enhancements, and overall morale in the workplace. Cline and Luiz's study focused on information technology, and was generalised to nursing staff and hospital administrators, who were not included in this current study. The study also included various health facilities, including clinics, which this current study did not include. The use of information technology was however a component of this current study. In addition, the study was conducted in public sector health facilities in developing countries, which makes it relevant to this current study's Windhoek Central and Katutura hospitals, which are public sector health facilities in a developing country (Namibia). Cline and Luiz's study is therefore of some relevance to this current study.

Another important study was conducted by Norbet and Lwoga (2012) to determine the information-seeking behaviour of physicians in Tanzania. The study was based on Wilson's (1996) model of information behaviour, which this current study also used as its basis. The researchers personally distributed

questionnaires to all physicians. The study found that the physicians needed information to enhance their knowledge on day-to-day patient care, rather than information for research or further education purposes. The physicians preferred to seek information from formal sources (printed textbooks, electronic resources and printed journals). There was low use of Internet for prescribing various drugs and diagnosis. Factors such as poor ICT infrastructure, lack of access to computers, frequent power cuts, and lack of time were the major barriers that inhibited physicians in seeking information. Norbet and Lwoga's study is closely related to this current study in that it focused on physicians, used Wilson's (1996) model, compared the purposes for seeking information, sources of information, use of information technologies, access to information and barriers in seeking information. The main difference is that the study only used a quantitative method (questionnaire). This current study should add value to studies such as Norbet and Lwoga's as it aimed to find out similar issues in a Namibian setting. When findings are similar in different contexts, then it becomes more probable that the findings can be generalised. When the findings are significantly different, then context becomes a factor with regard to the information needs and information-seeking behaviour of medical doctors.

Tumwikirize, Ogwai-Okeng, Vernby, Anokbonggo, Gustafesson, and Lundborg (2009) conducted a cross-sectional survey on 'Access and use of medicines information sources by physicians in public hospitals in Uganda'. In another study in Uganda, Kapiriri and Bondy (2006) sought to find out the information needs and seeking behaviour of health practitioners and health planners for

decision-making in Uganda, using a self-administered questionnaire. The respondents indicated that personal experience, discussion with colleagues, and national policy and treatment guidelines were most influential when making decisions in health care and planning. The sources of information used most were colleagues, doctors' statements and text books, while the least used sources were the Internet and the library. Although Kapiriri and Bondy's study was on health practitioners in general and in the general context of Uganda, the study is of relevance to this current study as it focused on information needs and seeking behaviour of health practitioners. This current research strengthens studies such as Kapiriri and Bondy's study in terms of ascertaining the most used information sources and the challenges faced in seeking information.

While no known study has been carried out in Zimbabwe on information needs and information behaviour of medical doctors, a study by Chikonzo and Aina (2001) on the information environment of veterinary researchers at the University of Zimbabwe is of some relevance to this study. Chikonzo and Aina's (2001) study involved 53 veterinary researchers comprising professors, lecturers, teaching assistants, and veterinary technicians at the University of Zimbabwe. The study found that the following were the reasons for seeking information: researching on a new topic, preparing lecture notes, preparing a conference paper, and career development, developing proposals, writing manuscripts, writing papers for publication, reviewing a paper, following up on seminars, identifying new parasites, information on new laboratory techniques, and sourcing for research funding. In addition, the results of Chikonzo and Aina's

study showed that the Veterinary Science branch library at the university was the main provider of veterinary information to researchers, thereby justifying the need to strengthen the library resources. Journal articles were the most preferred content, while textbooks were second.

Although the above-mentioned studies are helpful to give a picture of information needs and seeking behaviour, most of them are not particularly on medical doctors. Out of the continental articles that were found on information needs and information-seeking behaviour, only a few (Abbas et al., 2013; Andualem et al., 2013; Norbet & Lwoga, 2012; Arraid, 2011) were found to be significantly relevant to the current study.

The above review of international and continental literature shows that context plays an important role in information needs and information seeking, in agreement with Wilson (1999), upon which this current study is based. It is therefore logical to review literature on information needs and information-seeking behaviour in Namibia, which is the context of this study.

2.4 Existing literature on information needs and information-seeking behaviour of medical doctors in Namibia

While no studies were found on the information needs and information-seeking behaviour of practising medical doctors in Namibia, a few were found on different information user groups.

Mabhiza (2016), like many other researchers (Andualem et al., 2013; Cline & Luiz, 2013; Matsveru, 2013; Chiware & Dickson, 2008), used a mixed-methods

approach to investigate the information-seeking behaviours of veterinary scientists in Namibia. Results were that the majority of the veterinary scientists need information for continuing professional development. These findings concur with those of Nel and Fourie's (2010) study, which revealed that veterinary practitioners in South Africa seek information to keep up-to-date. Mabhiza's (2016) study also revealed that the information sources preferred by veterinary scientists included personal notes, work colleagues, guidelines, and textbooks. Libraries were the least used source of information in Mabhiza's (2016) study and this is confirmed by Nel and Fourie (2010). Although this study was on animal doctors, the study is relevant as it involved medical practitioners, which this current study also focused on.

Mabhiza, Shatona, and Hamutumwa (2012) used a survey research design to investigate 'The information seeking behaviours of academic researchers from the Faculty of Economic and Management Sciences at the University of Namibia'. Results were that most faculty members sought information when preparing for lectures, to update their knowledge, and when writing and presenting papers. The only similarity between Mabhiza et al.'s (2012) and the current study is that they both focus on information behaviour of professionals.

Mchombu (2012) used a qualitative research method to 'investigate the information needs for poverty eradication at Greenwell Matongo in Katutura, Windhoek'. Results showed that young people seemed to be more aware of the information needs and channels compared to adults who lacked awareness of the information flows. Illiteracy, powerlessness, and lack of proficiency in the

English language were cited as some of the barriers to accessing available information' (Mchombu, 2012, p. 88). Illiteracy and one's level of education and language barriers affected one's information-seeking behaviour.

Matsveru (2013) used a mixed-methods research methodology to conduct a study on the information needs and information-seeking behaviour of pastors in Namibia. The current study employed the same research methodology. Matsveru's study revealed that pastors need information for counselling, community development, administration, evangelism, and preaching. In other words, they need information for continuing professional development. The study also revealed that pastors used formal sources of information such as Bible concordances, Bible translations, theological works, background information to the Bible and devotional books. They also used church documents, the Internet, and personal libraries.

Mnubi-Mchombu, Mostert, and Ocholla (2009) conducted a qualitative study on the information needs and information-seeking behaviours of orphans and vulnerable children (OVC) and their caregivers in Okahandja, Namibia. Results showed that OVC used relatives, teachers, and friends as their main sources of information. The television, books, radio, newspapers, and church leaders were also popular information channels. The caregivers in Mnubi-Mchombu et al.'s study preferred interpersonal communication, and used social workers and relatives as their main sources of information. Other channels used for disseminating information included workshops and seminars, radios, and newspapers. Mnubi-Mchombu et al.'s study found that most service providers

produced leaflets and posters, and organised meetings in order to disseminate information to their target group.

Chiware and Dickson (2008) used a mixed-methods approach to conduct a study on the information-seeking behaviour of small and medium enterprises in Namibia and found out that the participants were largely dependent on informal information sources despite the existence of a wide range of business information services in Namibia. Although Chiware and Dickson's (2008) study may not be relevant in terms of user group, it sheds light into the practical situation in Namibia with regard to the general information culture. The current study adopted the mixed-methods approach to enhance the understanding gained from the quantitative data by obtaining more in-depth information from qualitative data, and to integrate the advantages of both methods.

It is of concern that across all groups of information users, the literature reviewed has shown little use of libraries on the African continent. This is not something new, as the same sentiments were aired 23 years ago in Kale's (1994) paper entitled 'Health information for the developing world'. Kale noted that health workers in many countries, particularly in sub-Saharan Africa, had no access to up-to-date information and this is why they did not visit libraries; the library lacks up-to-date information sources.

Reviewed literature has also revealed that medical doctors need information mainly to enhance their knowledge for patient care, more than for research or further education purposes. This implies that doctors in Africa use information, but do not create information, which also brings into question the relevance of

the information they use. Literature has also revealed that personal libraries and books are the preferred sources of information rather than journals. According to Kale (1994), the same was experienced in India and Mexico. However, Tunde's (2016) study revealed that inadequate resources, lack of qualified staff, limited funding, high cost of journal subscriptions, limited library space, and limited opening hours of the library are some of the factors that affect the information-seeking behaviour of practising medical doctors.

The goal of this literature review was to ground the researcher and to gain an understanding of existing knowledge around the topic under study. This would help the researcher to find gaps in the extant literature, thereby demonstrating the significance of the study.

Having reviewed literature in the light of context (international, continental, and local), the next sections focus on literature in the light of the objectives of the study, as outlined in Chapter 1, and in the light of the information behaviour models outlined in Chapter 3.

2.5   Information needs of medical doctors

Before reviewing literature on information needs and information-seeking behaviour of medical doctors, there is a need to gain a clear understanding of a global perspective of what information and information need mean.

2.5.1   Information

The word 'information' is derived from the Latin word *'informare',* which means, 'to give form' or 'to design' (Ryden, 2008). Reitz (2010) defines information as

'data presented in a comprehensible form to which meaning has been attributed within the context of its use'. In other words, specific data can be considered as information if it transports a meaning to the person who gets it.

According to Buckland (1991), information may be regarded as a 'thing', as a 'process', and as 'knowledge'. Information as a 'thing' is used attributively to denote to objects, such as books, DVDs, and CDs as they have the features of imparting knowledge. Information as a 'process' denotes the act of informing, telling, or sharing knowledge. Information as 'knowledge' represents that which is perceived in information as a 'process', that is, the knowledge communicated.

The new paradigm in information seeking is to view all three as something in someone's mind and not primarily as a physical object (Case, 2005, p. 65). In this study, therefore, the terms 'data,' 'information', and 'knowledge' are used synonymously, because they are not clearly delineated in studies of information behaviour.

2.5.2   Information need

Rertz (2004) defines information need as 'a gap' in a person's knowledge that, when experienced at the conscious level as a question, gives rise to a search for an answer. If the need is urgent, the search may be pursued with diligence until the desire is fulfilled. According to Grunig (1989), needs are an 'inner motivational state' that brings about thought and action (p. 209). This 'inner state' may include wanting, believing, doubting, fearing, or expecting (Liebenau & Backhouse, 1990). Green (1990) has identified four general conclusions about

needs thus: needs are instrumental, usually contestable, necessary, and are not necessarily a state of one's mind.

Needs, as Green (1990) points out, are instrumental in the sense that when they are pursued, they help one to reach a desired goal. According to Green (1990), needs are usually contestable because they are different from wants. A need is a necessity without which one may not be able to satisfy primary needs, while a want is something one can live without. Lastly, needs are not necessarily a state of mind, for it is possible to be unaware of one's true need (pp. 65-67). Gorman (1995) also classifies needs into four types: recognised (obvious needs); pursued (needs that are actually being followed by the individual); satisfied (sources of established knowledge or data); and unrecognised (needs not recognised by the individual). Information needs vary according to users' membership in professional or social groups, their demographic backgrounds, and the specific requirements of the task they are performing (Choo & Auster, 1993, p. 284). In other words, it is the information need that leads to information seeking.

According to Chen and Hernon (1982), all people need accurate information to make intelligent decisions about issues that concern them. There is no doubt that medical doctors, like any other professionals, need information to do their medical work. Gorman (1995) identified four types of doctors' information needs: unrecognised needs, recognised needs, pursued needs, and satisfied needs.

According to Gorman (1995), unrecognised needs occur when doctors are not aware of the information they need. An information system cannot predict an

unrecognised need, since the user cannot recognise the need. However, new technology systems such as reminder systems and clinical-decision-support systems are ideal sources of information to address unrecognised needs. Recognised needs refer to the awareness by doctors or observers that information is needed, which may or may not result in a search. Pursued needs occur when information is recognised and later recalled, while satisfied needs occur when information is successfully pursued (Gorman, 1995).

Chambliss and Conley (1996) point out that doctors need information for two main reasons: to answer specific patient queries; and to be updated with current improvements in the medical field.

Bryant (2004), in his study on information needs and information-seeking behaviour of family doctors, found the following perceived information needs of medical doctors: clinical care; keeping up-to-date; information for patients; pharmacological information; gaps in knowledge; curiosity; and uncertainty.

Clarke et al.'s (2013) review of 24 articles on information needs and information-seeking behaviour analysis of primary care physicians and nurses revealed that medical doctors seek information on diagnosis, medication, treatment, epidemiology, prognosis, and aetiology. Davies (2009) reiterates that the top categories of information needs are treatment or therapy, diagnosis, and drug therapy. It can be noted from all the studies that the main reason doctors seek information is so that they can help patients and for personal knowledge.

Context also plays an important role in information needs. Zeng and Cimino (2000) examined the information needs of doctors in both outpatient and inpatient settings and identified three aspects related to information need, namely, source, time, and concept. 'Source' is concerned with where data are collected. 'Time' refers to when the data are collected, while 'Concept' is about the content of the data. The results of the study showed that the utilisation of these three views was different depending on the situation.

In this study, 'information need' is defined as the expression of missing information that is required to accomplish a specific task, which in this case is managing patient care.

Now that information and information needs have been defined, it is also important to understand information-seeking behaviour.

2.6 Information-seeking behaviour of medical doctors

Spink and Cole (2007) define information seeking as 'a sub-set of information behaviour that includes the purposive seeking of information in relation to a goal' (p. 262). According to Wilson (1999), purposive seeking for information is a result of a need to satisfy some goal. The seeker exists in an environment that partially determines, constrains, and supports the types of needs and inquiries that arise. According to Belkin and Croft (1992), the process is necessitated by a problem and a need to solve it. However, Sperber and Wilson (1995) have cautioned that it is not only because of problems or because of a need to make decisions that people seek information. Sometimes people seek information simply out of the desire to have more information.

Case (2006) states that information behaviour 'encompasses information seeking as well as the totality of other unintentional or passive behaviours…, as well as purposive behaviours that do not involve seeking, such as actively avoiding information' (p. 5). Information behaviour takes place in a context. Dewey (cited in Case, 2006, p. 47) defines context as 'a selective interest or bias, which conditions the subject matter of thinking'. According to Bateson (cited in Case, 2006, p. 47), context is 'the pattern that connects …, without context there is no meaning'.

Information seeking is a decision that people make in answering their questions. In making this decision, they look at the cost of finding the information, its value, and the cost of not having it. Information seeking is therefore an important step to problem solving. The process begins when someone perceives that the current state of knowledge is less than that needed to deal with some issues (Dervin, 2005). The process includes recognising and interpreting the information problem, establishing a plan of search, conducting the search, evaluating the findings and, if necessary, iterating through the process again (Hearst, 2009). If information is located and is used, then the information seeking was successful. If the located information fails to satisfy the original perceived need, the process of information seeking is likely to continue.

The information-seeking behaviour of doctors is the process by which doctors ask and get an answer for their clinical questions. Ely, Chambliss, Ebell, and Rosenbaum (1991) have divided the process into five stages: realises

uncertainty; formulates a question; pursues an answer to a question; finds an answer for a question; and applies the answer to patient care.

González-González et al. (2007) investigated different patterns of primary care doctors' information seeking. The participating doctors indicated that they asked 635 questions and 84 (13.2%) of the questions were pursued after the consultation to seek for answers. Also, 61 (9.6%) were pursued during the consultation and 490 (77.2%) of the questions were not pursued at all.

Information seeking by doctors has been examined in different context scenarios, including outpatient departments, wards, and emergency rooms. Covell, Uman, and Manning (1985) found that only 30% of doctors' information needs had been met during the patient visit. Lappa (2005) found that information-seeking behaviour in the emergency department is critical due to the situation of the area and time constraints. Tan, Stark, Lowinger, Ri~gland, and Pearson (2006) have reiterated that the process of information seeking is context oriented and that it varies from person to person and from ward to ward, and that it requires access to information sources.

Nylenna and Aasland (2000) investigated the information-seeking behaviour of primary care doctors and compared this with hospital doctors' information-seeking behaviour. They found that courses, meetings, and congresses were considered the most important continuing medical education activities for Norwegian doctors. They also found that primary care doctors spend less than three hours per week on medical reading, whereas hospital doctors spend four-and-half hours per week. This confirms that one's context plays a major role in

information seeking. Bigdeli (2004) investigated the information-seeking behaviour of specialists, residents, and interns of Ahvaz University of Medical Science in Iran and found that most of the respondents obtained information from information channels such as conferences to keep up-to-date with new information. In contrast, Bennett, Casebeer, Zheng, and Kristofco (2006) investigated doctors' information-seeking behaviour in using the Internet. The survey results showed that the importance of journals and meetings had declined since 2001, while the importance of accessing electronic resources had increased. It should be noted that the gap in terms of years between these studies could be the main reason the results are different.

In this study, information-seeking behaviour is defined as the way in which practising medical doctors search for and utilise information to satisfy an information need. As practising medical doctors carry out their different duties, they certainly need information.

Spink and Cole (2007) have reiterated that information-seeking behaviour is a unique attribute that differentiates people from animals. Of the 24 articles reviewed by Clarke (2013) on information-seeking behaviour of medical doctors, 19 articles mentioned the Internet, 18 articles mentioned textbooks, 13 articles mentioned colleagues, 17 articles mentioned journals, eight articles mentioned professional websites, and 7 articles mentioned medical libraries. Flynn and McGuinness' (2010) survey revealed that traditional resources (textbooks and journals) are used more, compared to the Internet. This current study aimed to

identify the various types of information sources that are used by practising medical doctors at Katutura and Windhoek Central state hospitals.

Understanding the process by which practising medical doctors seek information and what resources they use helps to answer the question: 'What should be done by health information service providers to support practising medical doctors at Katutura and Windhoek Central state hospitals?'

2.7   Information sources used by practising medical doctors

The reviewed literature showed that doctors seek information from different types and formats of information sources depending on the purpose of the information need. Gorman (1995) has classified the information sources accessed by medical doctors into five groups: patient data (information taken from the patient's records, family, friends, and self-reports); medical knowledge (information obtained from research and practice from journals and textbooks); logistical information (information from policies and procedures); population statistics (aggregated data on many patients taken from public health reports); and social influences (patterns of local practice as learned from talking with colleagues) (Gorman, 1995, p. 732-3).

The information source used is influenced by the purpose for which that information is needed and its availability. Covell, Uman, and Manning (1985) listed only three sources of information, namely, printed sources, human sources, and other sources. Printed sources include medical textbooks, pharmaceutical textbooks, journals, drug company information, and self-made compendia. Human sources include specialists, generalists, office partners,

pharmacists, nurses, and other health professionals. Other sources include laboratory data and patient responses. Ocheibi and Buba (2003) studied the library as an information source for doctors. They classified information sources as formal (journals and books), informal (meetings and seminars), and semi-formal (unpublished reports and thesis).

Medical knowledge and experiences, both personal and obtained from communicating with other professionals, are the source of information used most frequently by doctors for their medical practice. Thompson (1997) reviewed the literature on primary care doctors and the preferred characteristics of the information resources they use. She found that doctors frequently rely on their medical knowledge built over years of clinical experience and practice for patient care. Another study conducted by Dee and Blazek (1993) found that doctors rely more on their colleagues for information. However, this contradicts results of a study by Covell, Uman, and Manning (1985), which showed that print sources are the most used information sources by doctors.

A literature study performed by Coumou and Meijman (2006) revealed that doctors seek answers to a small number of their clinical questions and when they do, they refer first to colleagues and paper sources. The study found that although new developments in information technology, such as the Internet, facilitate doctors' access to a large body of electronic clinical information, this does not change the practice of doctors in seeking out information from colleagues. Whatever the case may be, literature has shown that asking colleagues has an impact on clinical decision-making by medical doctors.

Green's (1990) study revealed that colleagues are a handy source of information because they are quick to find, but one needs to consider the limitations and pitfalls of depending on verbal interactions alone.

As already discussed, an information need often leads the user to search for information, making demands upon a range of information sources. Bryant's (2004) study on family doctors found the following as sources of information: colleagues, personal collection; electronic resources; practice library; Individuals; and medical library. Bryant further notes that colleagues and personal collections are the most preferred resources. Flynn and McGuinness (2010) reiterate that colleagues are used widely because they are familiar, reliable, immediately available, and inexpensive. In addition, Clarke et al.'s (2006) review of 24 articles revealed that although informal, colleagues were the first source of information, possibly because of the quickness and ease of gaining information from other doctors.

Case (2006) highlights information sources as being either formal or informal. Formal sources include to textbooks, encyclopaedias, and daily newspapers, while informal sources tend to be friends, colleagues, and family.

The use of electronic information sources was the second preferred behaviour in Bryant's study, but in Clarke et al.'s study, review journals were mentioned as the second source of information. Journals were favoured because of the increase in the use of evidenced-based medicine. In third place was seeking information from specialists and colleagues. Using a medical library was the least common means of seeking information.

The literature therefore shows that colleagues and personal collections play a major role as sources of information in the medical fraternity.

2.8   Barriers to obtaining information for practising medical doctors

A literature review on information barriers was undertaken. Despite the existence and availability of many resources that can provide practising medical doctors with information, there are certain challenges that hinder medical doctors from obtaining the information they need for their medical work. Clarke et al.'s (2013) analysis of information needs and information-seeking behaviour of primary care physicians and nurses identified lack of time and search skills as barriers to information seeking. While the Internet can facilitate better access to information by all, a study by Gorman (2001) in Oregon confirmed that rural primary care physicians have trouble accessing information; hence, the Internet alone cannot be a solution to geographic location barriers faced by rural doctors (p. 185).

Information overload was also identified as another barrier to information access. Information overload occurs when information received becomes more of a hindrance rather than a help. Doctors have limited time to review and process patient data. The effects of information overload are failing to process some of the inputs, processing information incorrectly, delaying the processing of information, accepting lower-quality information and giving up the search for needed information, hence the need to present information in a way that will make it accessible to the doctors.

Accessibility of information sources is an important recurring theme in literature. Reitz (2010) defines accessibility as the ease with which a person may enter a library, gain access to its online systems, use its resources, and obtain needed information regardless of format. According to Aguolu and Aguolu (2002), resources may be available and even identified bibliographically as relevant to one's subject of interest, but the user may not be able to lay hands on them because the information sources are in a special collection. The items may be inaccessible because no user education was conducted to inform the library users. Accessibility, according to Horrocks (1994), depends on factors such as staff professionalism, customer orientation, and energetic use of information communication technologies. This current study investigated these issues to see how they affect the information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals.

According to Heeks (1999), information communication technologies (ICTs) are the 'electronic means of processing, capturing, storing and communicating information' (p. 3). There is a distinction between old and new ICTs. Old ICTs refer to radio and television, while new ICTs include computers, e-mail, Internet, word-processing, and other data processing applications. ICTs are merely a technology-based means of transmitting information, enhancing knowledge, increasing productivity, and creating new products and services. The use of ICTs by practising medical doctors will help in the capturing, processing, storing and communication of information. This study therefore investigated how often practising medical doctors use ICTs for health information services.

Above all, accessibility of information requires a network of constructive partnerships among diverse individuals, institutions, and interests. Wilson's (1996) Information Behaviour Model incorporates the concept of intervening variables into information-seeking behaviour. These intervening variables can be classified as personal, interpersonal, situational, and information source characteristics. Wilson's concept of intervening variables agrees with Lilley's (2008) five characteristics that have an impact on information seeking: having relatively better education or higher language literacy; being mostly multilingual and multi-literate in a cross-cultural environment; having greater social participation; being well known and liked in the community; and having more exposure to different kinds of information resources.

The doctor's level of education, reading culture, popularity, and community participation may also hinder access to information even though the information may be available (Wilson & Walsh, 1996). Personal barriers therefore include education levels, knowledge base, demographic variables, and other factors (Wilson & Walsh, 1996). Formal education is an important facet in information seeking. However, education is not only about knowledge and skills, but also about the ability to seek information (Kristiansen, Kimeme, Mbwambo, & Wahid, 2005, p. 169). Wynne and Lyne (2004) identified low levels of education as barriers to assembling and interpreting information. Mchombu (2000) asserts that illiteracy is a major constraint to accessing information, as the information seeker may not know where or how to obtain it.

The situation in itself may also impose barriers of an economic, political, geographic, or other nature (Wilson & Walsh, 1996). Some of these barriers may be state policies or regulations. Language is another situational barrier that can inhibit access to information. Namibia's population, though very small (slightly over 2 million), is highly diversified in terms of language. Even though English is now the official language, many information sources are still in Afrikaans.

The more accessible information sources are, the more likely they are to be used (Meyers, Nathan, & Saxton, 2007). As the users access information sources, they may encounter conceptual, linguistic, critical, bibliographical, or physical inaccessibility. It is for this reason that Harris and Dewdney (1994) have argued that, '… information should be physically, psychologically, and intellectually accessible' (p. 22). If people cannot access information because of its language or level at which it was written, then it is as good as not having that information. In fact, they will not use it.

In their fourth principle of information seeking, Harris and Dewdney (1994) state that people tend to seek help or information from interpersonal sources, especially from people like themselves. This principle works well with theories of collaborative learning such as the developmental and the cognitive theories, which state that peer interaction is a key mechanism in knowledge construction. While this can be viewed positively, Lee and Cho (2011:214) argue that such segregated communication and information sharing can negatively affect a group's ability to learn and perform. This was also reiterated by Granovetter (cited in Lee & Cho, 2011, p. 219) who asserts that 'social networks prevent

group members from acquiring innovative and creative ideas from out-group members'.

Case's (2006) opinion is that humans generally tend to seek information that is compatible with their prior knowledge, beliefs, and opinions, and to avoid exposure to information that conflicts with what they already know (p. 97). The purpose of this study was to find out how practising medical doctors at Katutura and Windhoek Central State hospitals seek information and from where.

Wicks (1999, p. 209) hypothesised that the information-seeking behaviour of people is influenced by the 'role they are playing at a particular time'. Doctors work in different contexts. Some doctors work in wards, others in emergency rooms, while others work in outpatient departments. The pattern of information-seeking behaviour can also be 'open' or 'closed'. An open information-seeking behaviour is one in which an individual is not restricted to consult from a certain source. On the other hand, a closed information-seeking behaviour is one in which individuals are restricted to consult from known information sources. In other words, the roles and rules influence the sources of information to which practising medical doctors turn at a given time.

According to Harris and Dewdney (1994), information needs arise from the help-seeker's situation and not so much in the demographic character of the user. In other words, it is the context that drives an individual to seek information and not culture, age, or race. However, a survey by the Auckland City Libraries (1995) revealed that an unfriendly environment, lack of staff, difficulty of finding books

and poor customer service by library staff were some of the reasons why people were not using libraries.

The reviewed literature identified several barriers to information seeking. These range from personal, environmental, attitudinal, institutional, economic, and social barriers. However, given the fast growth taking place in Namibia in terms of economy and education, some of these shortcomings might soon be a thing of the past. This study therefore investigated what information services practising medical doctors use and the reason why they do not use others.

2.9 Conclusion

The literature reviewed has addressed all the research objectives posed in the study and what has emerged is that, having looked at international, African and specifically, Namibian literature, there is no research on information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals. The literature review also shows that only a few studies have been conducted in Africa on the same subject. It also reveals that while service providers exist with an abundance of medical information, doctors still face many problems in either being aware of the existence such medical information or accessing it. The literature review has shown that though there are many information-seeking models, Wilson's (1996) is suited for this study, which is explained in detail in Chapter 3. The next chapter looks at the different information seeking models that help to explain human behaviour when looking for information, and why Wilson's 1996 model was chosen for this current study.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 Introduction

This study is anchored on Wilson's (1996) information-seeking model. The researcher chose Wilson's model because it is applicable in multiple contexts, occupations, roles, and knowledge domains. The model makes reference to information needs, information behaviour, information sources, and factors affecting information-seeking behaviour, which are the thrust of this study.

Studies in information needs and information-seeking behaviour are known to some scholars as 'user studies' (Carr, 2006; Eskola, 1998; Mann, 2005). User studies have resulted in the development of a number of information seeking models to explain human behaviour. They explain how information needs arise and how people search for information. A model according to Wilson (1999, p. 129) is:

> … a framework for thinking about a problem and may evolve into a statement of the relationships among theoretical propositions.… [Models] are statements, often in the form of diagrams that attempt to describe an information-seeking activity, the causes and consequences of that activity, or the relationships among stages in information-seeking behaviour.

Some of these models are Wilson's (1996) model of information-seeking behaviour (MISB); Dervin's (2003) sense-making theory (SMT); Ellis' (1989) behavioural model of information seeking strategies (BMISS), and Kuhlthau's

(1991) model of the stages of information-seeking (MSI). Behind these models is the belief that information seeking is a result of the recognition of some need perceived by the user.

This study sought to understand the information needs of practising medical doctors at Katutura and Windhoek Central state hospitals and how they seek information. The four models mentioned above are discussed in more detail below, beginning with Ellis, followed by Kuhlthau and Dervin, and ending with Wilson's model upon which this study is based. The model was chosen not only because it identifies potential personal variables and modes of seeking information, but also because it suggests relevant theories of motivation behind search behaviour.

3.2 Ellis' (1989) behavioural model of information seeking strategies
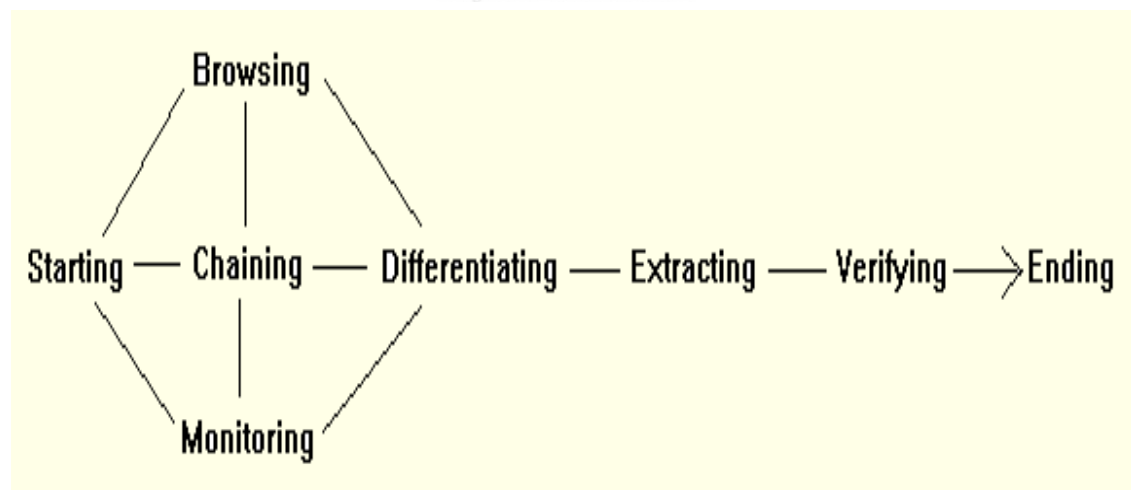
Figure 3.1: Ellis' (1989) behavioural model of information seeking strategies

According to Ellis, information seeking involves different behaviours. Wilson (1999) recognises that Ellis does not claim that these different behaviours make up a single set of stages. Ellis' use of the term 'features' and not 'stages' affirms this fact. The strength of Ellis' model is that it is based on empirical research and it has stood the test of time. Below is a list of Ellis' features, as cited in Wilson (1999):

Starting: the means employed by the user to begin seeking information;

Chaining: following footnotes and citations in known material or 'forward' chaining from known items through citation indexes;

Browsing: semi-directed or semi-structured searching;

Differentiating: using known differences in information sources as a way of filtering the amount of information obtained;

Monitoring: keeping up-to-date or current awareness searching;

Extracting: selectively identifying relevant material in an information source;

Verifying: checking the accuracy of the information;

Ending: 'tying up loose ends' through a final search.

Ellis points out that, '...the interaction of the features in any individual information seeking pattern will depend on the unique circumstances of the information seeking activities of the person concerned at that particular point in time' (p. 178).

Although these are meant to be 'features' rather than 'stages' of the information seeking process, Wilson sees a logical pattern from the first feature (Starting) to the last one (Ending). He, however, notes that while Browsing, Chaining, and Monitoring are search procedures, Extracting is an action performed on the information sources, and Differentiating is a filtering process. As a result, Wilson classifies Ellis' features into micro-analysis of search behaviour (starting, chaining, extracting, verifying, ending) and macro-analysis of information behaviour (browsing, monitoring, differentiating).

Järvelin and Wilson (2003) have argued that although there are some strengths in Ellis' model (e.g. it is based on empirical research, it has been tested in a number of studies, and its features relate to each other, thereby giving it some order), its features may fall short because they are not explicitly related to external possible causative factors. The motivation for information seeking is from within, unlike in Wilson's model where context or role-play influences information seeking. Ellis' 1989 model, therefore, is not best suited for this study, as this study also investigated the roles or contexts that necessitate information seeking by medical doctors.

3.3 Kuhlthau's (1991) model of the stages of information-seeking

Kuhlthau's model is based on that of Ellis. Kuhlthau attaches the associated feelings, thoughts, actions, and information tasks to Ellis' eight information search process features, making Kuhlthau's model more phenomenological than cognitive (Wilson, 1999, p. 18). The stages of Kuhlthau's model are Initiation, Selection, Exploration, Formulation, Collection, and Presentation.

During the Initiation stage, the information seeker recognises the need for new information to complete an assignment. As they think about the topic, they may discuss it with others. This stage of the information seeking process is filled with feelings of apprehension and uncertainty. In the Selection stage, individuals begin to decide what topic will be investigated and how to proceed. At this point, some information retrieval may occur. The uncertainty experienced at the Initiation stage fades with the selection of a topic and is replaced with a sense of optimism.

At the Exploration stage, information on the topic is gathered, and new personal knowledge is created. Learners endeavour to locate new information and situate it within their previous understanding of the topic. At this stage, feelings of anxiety may return if the information seeker finds inconsistent information.

During the Formulation stage, the information seeker evaluates the information that has been gathered. A focused perspective begins to form, and there is not as much confusion and uncertainty as in earlier stages. Here, the information seeker will formulate a personalised construction of the topic from the general information gathered at the Exploration stage. During the Collection stage, the information seeker knows what is needed to complete the assignment. Now presented with a focused, personalised topic, the information seeker will experience greater interest and increased confidence in accomplishing the assignment.

At the Presentation stage, the individual has completed the information search. The information seeker will now summarise and report on the information that

was found. The information seeker will experience a sense of relief and satisfaction if the search was successful, and disappointment if the search was not successful.

Kuhlthau's attention to the feelings associated with the various information seeking stages and activities makes it more general than that of Ellis. According to Kuhlthau, the need to search for information is associated with uncertainty, which is expressed in feelings of doubt, confusion, and frustration. These feelings change as the searching proceeds and the searching is increasingly successful. Finding relevant information increases feelings of confidence, relief, satisfaction, and a sense of direction (Wilson 1999, p. 20). Wilson calls this 'a process of the gradual refinement of the problem area' (1999, p. 20). Kuhlthau's model has been applied to a series of longitudinal studies of high school students, and more recently, to the work of a securities analyst.

Ellis' and Kulthau's models appear to be similar at face value. Bringing them together shows their similarities, while at the same time bringing out the not so apparent differences. Wilson has done a diagrammatical comparison of the two models (Figure 3.2 below) to highlight the differences.
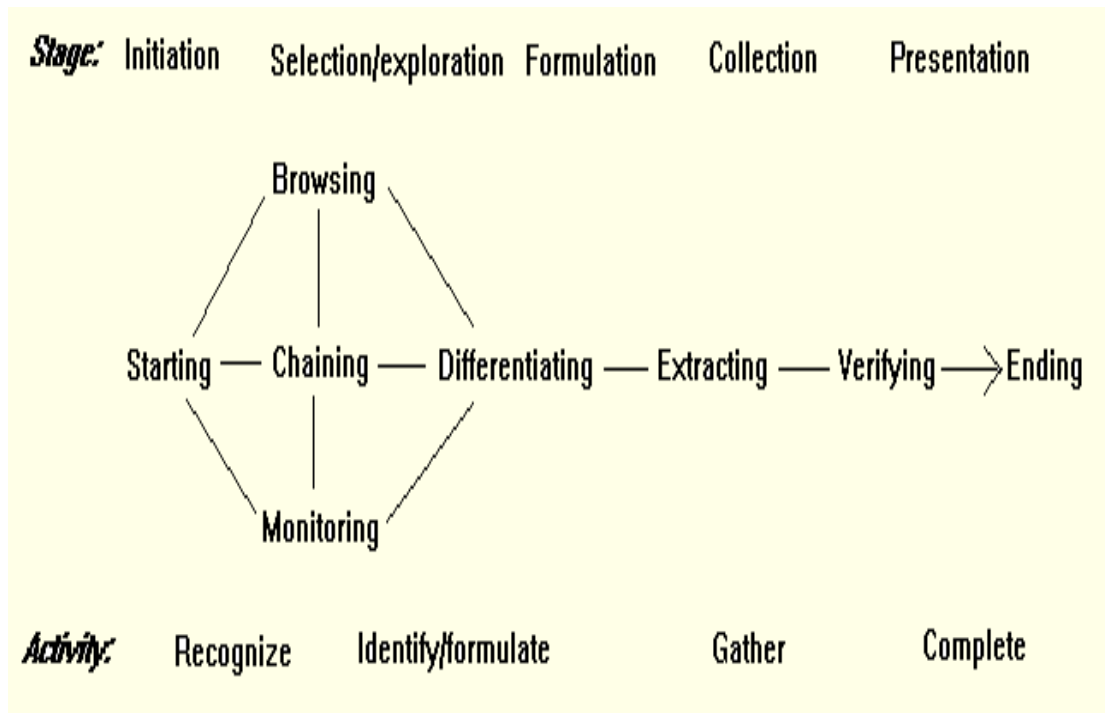
Figure 3.2: **A comparison of Ellis' and Kuhlthau's models**

(Source: Wilson, 1999)

Although they look similar on the surface, the major difference between the two models is that Ellis presents the elements of his model as 'modes of exploration or investigation' that may vary in sequence depending on the searcher's situation, while Kuhlthau's stages are based on her analysis of behaviour (Wilson 1999, p. 21).

3.4   Dervin's (2000) sense-making theory

The central idea of the SMT is that, as people move through time and space, they develop unique points of view from personal experiences and observations, and at some point, they come to a gap, where sense runs out and then needs

to be bridged. It is this gaping that causes the information seeker to behave in a certain way in trying to bridge the gap.

Sense-making is implemented in terms of four elements: a situation in time and space (context); a gap (the difference between the contextual situation and the desired situation); an outcome (the consequences of the sense-making process); and a bridge (some means of closing the gap between situation and outcome). Dervin has presented these elements diagrammatically regarding a triangle with a situation, a gap/bridge, and an outcome, as represented in Figure 3.3 below.
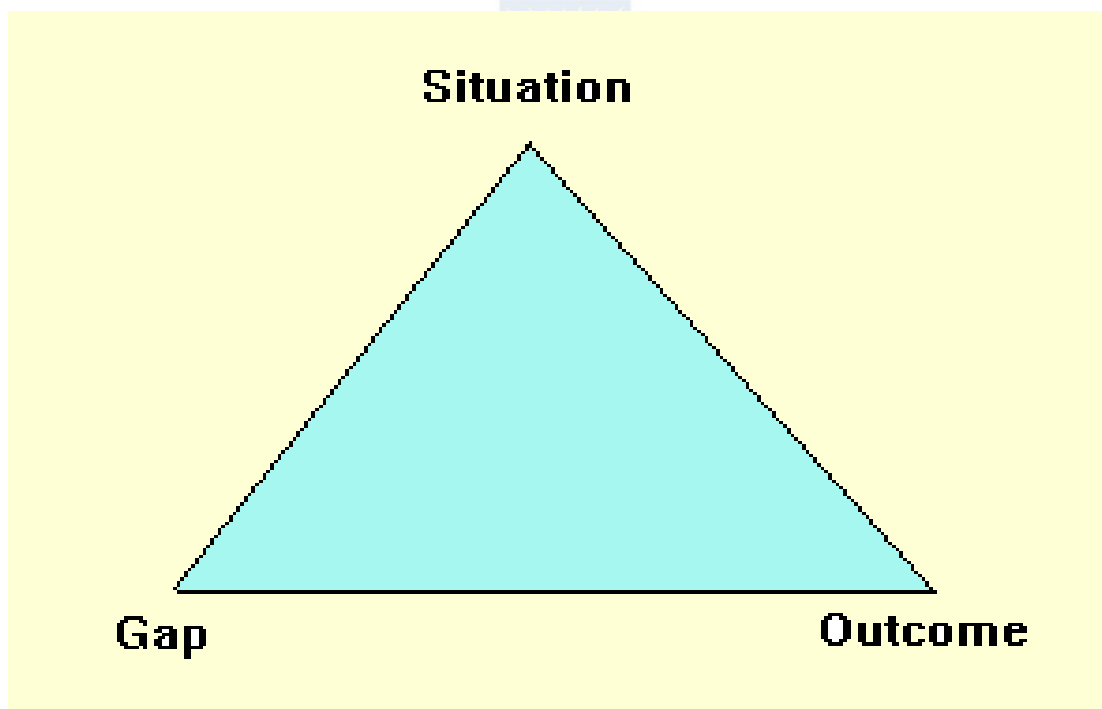
Figure 3.3: Dervin's 'sense-making' theory triangle

(Source: Wilson, 1999)

The same theory is also presented using the bridge metaphor as shown in Figure 3.4 below.

OUTCOMES:
*helps, hindrances
*functions, dysfunctions
*consequences, impacts, effects

BRIDGE:
*ideas, cognitions, thoughts
*attitudes, beliefs, values
*feelings, emotions, intuitions
*memories, stories, narratives

SITUATION:
*history
*experience
*past horizon
*present horizon

VERBINGS:
*sense-making
*sense-unmaking

GAP:
*questions, confusions
*muddles, riddles
*angst

SPACE-TIME

© 1999. Brenda Dervin

Figure 3.4: Dervin's sense-making model

(Source: Wilson, 1999)

According to Case (2006), the SMT has incorporated the belief that life is 'an encounter with problems and discontinuities in knowledge, and also the view that information is created as people interact with obstacles in life' (p. 159). It is through this active process that learning takes place or that the individual makes

sense of his or her situation, thus creating knowledge, opinions, institutions, evaluations, and responses.

Devin's model is very useful in informing about the process of information seeking. However, Devin's starting point is a conscious gap in information, which leads to information seeking. According to Wilson (1999), some people may not look for information even if they recognise a gap or a need. Therefore, the gap as a starting point in Dervin's model limits information behaviour. This study begins with the person-in-context, meaning that medical doctors in their clinical context are the beginning point of the study.

This research was based on Wilson's (1996) model of information-seeking behaviour. The next section attempts to give a brief analysis of Wilson's (1996) model of information-seeking behaviour.

3.5 Wilson's (1996) model of information-seeking behaviour

Wilson's model begins with the 'person-in-context', in which information needs arise. The needs are seen as secondary needs caused by primary needs, which are of a physiological, cognitive, or affective nature. The rise of a particular need is influenced by the context, which can be the person himself/herself, or the role the person plays in work, life or the environment. Intervening variables such as psychological factors (tending to be curious, or averse to risk), demographic background (age or education), factors related to one's social role (manager or mother), environmental, and information source characteristics (accessibility and credibility), might motivate or hinder information seeking. The risk or reward involved may lead to an active or passive information-seeking behaviour. The

information obtained is then processed and becomes an item of the user's knowledge, and is used directly or indirectly, to influence the environment and, as a result, create new information needs (Case, 2006).

Wilson's model has four different phases of obtaining information. These are: passive attention, passive search, active search, and ongoing search. Passive attention is when an individual acquires information from the environment with no previous intention of obtaining that information. Passive search is when certain information behaviour leads to accessing information that is relevant to the individual's information need. Active search is when a person actively searches for information. Ongoing search is when an individual already has knowledge in a specific area, but continues to search for information to keep up-to-date and/or expand his/her knowledge (Wilson 1999, p. 256).
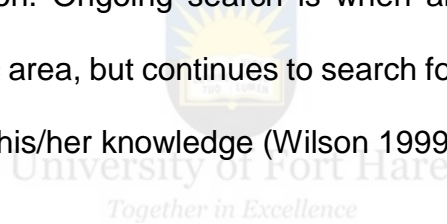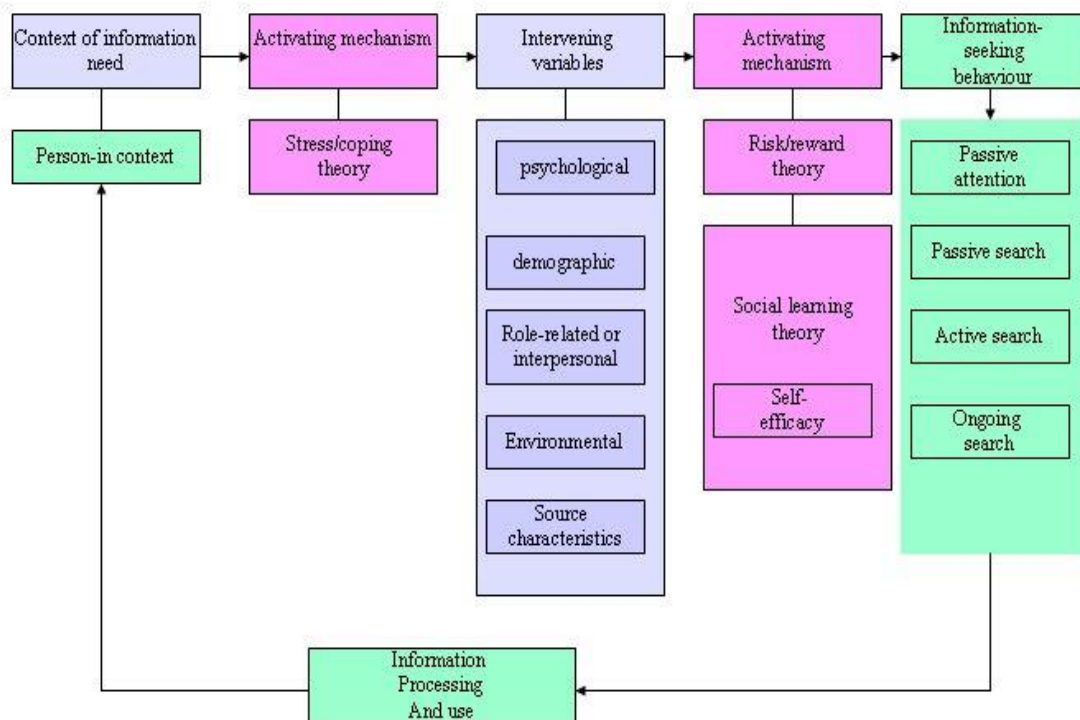
Figure 3.5: Wilson's (1996) model of information behaviour

(Source: Wilson, 1999, p. 257)

Wilson's (1996) Information Behaviour Model (as shown in Figure 3.5 above) pictures a cycle of information activities from the rise of an information need to information use. It includes intervening variables, which have a significant role of influencing the information behaviour of the searcher. Between the levels of person-in-context and the decision to look for information is what Wilson calls the 'activating' mechanism. Here, he notes that not every need leads to information seeking. The model identifies not only potential personal variables and modes of seeking information but also suggests relevant theories of motivations behind search behaviour. However, Niedźwiedzka (2003) has criticised the model for separating the 'context' from the intervening variables

109

and from features of the information sources. However, despite the criticism by Niedźwiedzka, Wilson's Information Behaviour Model gives the best framework for studying information behaviour.

Wilson has used the stress-coping theory to explain what motivates and stimulates information seeking while also using the social learning theory to explain why people may not pursue a goal successfully based on their perceptions of their own efficacy (Case, 2006; Wilson, 1999). Wilson's model attempts to describe information seeking activity, and its causes and consequences, or the relationships among stages in information behaviour. According to Case (2006), the model was intended to illustrate the broad scope of information behaviour and is more useful as a heuristic diagram for designing empirical studies of information seeking. The stages that the model outlines in information searching can be relevant in exploring the information needs and seeking patterns of medical doctors in Namibia.

3.6 Reasons for using Wilson's (1996) model

This study used Wilson's (1996) model of information needs and information-seeking behaviour as a framework to establish the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals. Three factors led this researcher to choose Wilson's model. First, the model is applicable in multiple contexts, occupations, roles, and knowledge domains. The demographic information given under Section 4.8 shows the diversity and multiplicity of the contexts of the participating doctors. Second, the model makes reference to information needs, behaviour

and sources, which are the thrust of this study, as is evident in the findings. The study sought to find out the information needs and information-seeking behaviour of the participants. Therefore, the information sources are embedded within the framework of information needs and the information-seeking behaviour throughout the thesis. In addition, Wilson's model attempts to depict and explain behaviour by referring to relevant variables, rather than merely indicating events. The correlations of these relevant variables will be seen in the results as the variables are presented and discussed. It should be noted that although Wilson refers to a sequence, this study only sought to simply find out the needs and behaviour, regardless of sequences.

Although the models of search process by Ellis (1989) and Kuhlthau (1991) are universally applicable to any domain, each depicting behaviour through which people are thought to move as they find and evaluate information, they make no claim to consider many of the factors and variables generally considered in information seeking research. Furthermore, when they were developed, the focus was on students and, as indicated earlier, the weakness of Ellis' model with regard to this current study is that it only focuses on internal factors and does not include possible external causative factors, such as role and context. According to Wilson (1999), both Ellis' and Kuhlthau's models attempt a different level of analysis than the models in focus here.

Generally, models are focused along some task, discipline, job, or group of people. For example, one of the recent models, proposed by Longo et al. (2005) and Longo et al. (2010), focuses on people with chronic diseases, such as breast

111

cancer. Longo et al's (2005) model was designed to help researchers understand the nature, source, and usage of health information related to chronic disease. The model was later modified in 2010 after Longo et al. investigated the information seeking behaviour of diabetic patients. The focus of these models is the use of health information by patients and not necessarily by medical doctors. Another example is the model proposed by Ingwersen (1996), which applies only to searching electronic information in databases or online library catalogues. The models of Menzel (1964) and Orr (1970) were intended to portray the information-seeking behaviour of scientists. Hernon's (1984) and Ellis' (1989) models were intended for social scientists, and the latter was extended to some physical scientists in 1993. Wilson's theory is applicable in multiple contexts, occupations, roles, groups of people, and knowledge domains. Hence, the researcher preferred to general nature of Wilson's model.

There is a possibility of using multiple models. However, based on the above discussion, the researcher found Wilson's model to be exclusively adequate for the purpose of the study.

Kuhlthau's research is based on psychologist George Kelley's 1963 theory of learning as a process of testing constructs. Uncertainty is a beginning in any search, and this is often accompanied by feelings of anxiety, which is a powerful motivator either to get on with the work or to give up entirely. Kuhlthau's work was pioneering in several ways, particularly in its attention to the role of affect in information behaviour. She was concerned with stages of a Search Process; her research on students demonstrates how they reach a state of closure as regards

their information needs. Uncertainty reduction is a key component in all of Kuhlthau's research. Kuhlthau's research is used a great deal in educational settings, at both high school and university levels.

Kuhlthau uses psychological theories of learning to advance the idea of uncertainty as a starting point in library research. She has also emphasises the importance of emotions in information behaviour and suggests that information seeking is expressed in stages. This model may do well in academic settings. This current study was conducted in a hospital setting and with medical doctors. Kuhlthau (1991) cites Dervin several times in elaborating the theoretical basis for her studies and models and the model is only applicable in certain ideal situations, while Dervin's theory is useful in many contexts, both within and outside the field of information science.

This study used Wilson's (1996) model as a framework to establish the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals. This researcher chose this model for this study because it is more fully developed and comprehensive than the other models discussed. It should be noted that Wilson's first model was developed in 1981. He then revised it in 1996. The 1996 model was also revised in 1999 (Rather and Ganaie, 2018). However, the researcher chose the 1996 model because the later 1999 one focused on problem-solving, while the 1996 one focuses on the context.

The main weakness in Kuhlthau's model is that the starting point is uncertainty. While uncertainty is part of Wilson's model, the person-in-context is the starting

point, which makes Wilson's model best suited for this particular study, which focused on practising medical doctors in the two major hospitals in Namibia. Another weakness of Kulthau's model is the focus on students, while this study focused on practising medical doctors. The strength of Wilson's model is that it can be applied to any field. Furthermore, Kuhlthau concentrates on the search process, and not on how the information need arises, which is the strength of Wilson's model.

Another major reason for this choice was the fact that Wilson's model attempts to depict and explain behaviour by referring to relevant variables, rather than merely indicating a sequence of events. In addition, the researcher chose this model because it makes reference to information needs and sources, which is what this study investigated.

This study attempted to explore the suitability of this model in designing effective information service for practising medical doctors at Katutura and Windhoek Central state hospitals after understanding their information needs and seeking behaviours in their endeavour to serve the Namibian nation.

3.7   Conclusion

This chapter looked at different information seeking models (Ellis' 1989 behavioural model of information seeking strategies; Kuhlthau's 1991 model of the stages of information-seeking; Dervin's 2003 sense-making theory; and Wilson's 1996 model of information-seeking behaviour). Strengths and weaknesses of each model were highlighted and the reasons for choosing Wilson's model for this study were explained. The model was chosen because

it is applicable in multiple contexts, occupations, roles, and knowledge domains. The model also makes reference to information needs, behaviour, sources, and factors affecting information seeking.

The next chapter presents the research methodology used to conduct the study on the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central State hospitals as they carry out their various duties.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

The mixed-methods approach was used in this study for the main reason that it minimises the weaknesses and draws from the strengths of an inclusively qualitative and quantitative research methodology.

This chapter describes the research methodology and techniques used to conduct the study. The chapter is organised into three main sections. The first section is on steps that were followed to decide on the appropriate research approach and data collection techniques. The second section focuses on data gathering techniques and sampling method used. The third section deals with data analysis and the method that was employed.

4.2 Steps undertaken to determine the research design

In designing a research methodology, there are essential steps to be taken, which can help to determine which method to employ in conducting research. These steps include re-reading the research aim, objectives, and questions and reviewing the methods that were employed by others who did similar studies. All these steps are explained in detail in the following subsections.

4.2.1 Research aim, objectives, and questions

Reviewing the research aim, objectives, and questions of this study helped the researcher to decide on the appropriate research methodology.

Since little is known about the information needs and information-seeking behaviour of practising medical doctors at Katurura and Windhoek Central state

hospitals, the researcher found exploratory research to be the ideal approach to answer the research questions. In this study, the 'what', 'where', 'how', 'when', and 'why' questions were set out to explore issues surrounding the information needs and information-seeking behaviour of doctors at the two hospitals. The study also sought to describe the current situation about information provision at Katutura and Windhoek Central state hospitals. It probed doctors' information needs and information-seeking behaviour to help in the development of a successful information system for doctors not only at Katutura and Windhoek Central state hospitals but possibly for all practising medical doctors in Namibia.

The exploratory research method is not without difficulties. According to Reaves (1992), the first difficulty has to do with the kind of information it produces. Exploratory research provides rich, complex, and non-specific information; thus, the researcher must approach it open-mindedly. Exploratory studies raise more new questions than answers. While this study aimed to answer new questions, the researcher hoped that other researchers interested in the information needs and information-seeking behaviour of practising medical doctors in Namibia would address some of the questions that are not addressed in this study.

4.2.2   Examples of methods used in previous studies

The literature reviewed showed that several research and data collection methods had been applied by different researchers. Survey research is used widely (Ocheibi & Buba, 2003; Wilson, Glanville, & Watt, 2003). The most commonly used instrument of data collection by these researchers is the

questionnaire, distributed through various means (mail, fax, and other electronic means).

Bennett et al. (2006), maintain that the survey approach is the best because it allows access to a large sample of doctors. Boissin and Docsi (2005) used interviews to explore the information-seeking behaviour and use of the Internet by general practitioners in France. They point out that interviews are better than questionnaires in providing an in-depth understanding of how doctors use the Internet. However, Bryant (2004) is certain that the case study approach provides an in-depth opinion. Some researchers have used focus groups (Bryant 2004) and the mixed methods approach in their studies (Smith, 1999). Smith found that mixed methodologies yield a more in-depth understanding of doctors' information needs and information-seeking behaviour.

The discussion above shows that no single research approach can be said to be perfect, as each study was conducted in a different context. Methods have been developed depending on the research questions as suggested by Gorman and Clayton (2005).

4.2.3   Theoretical framework of the research

Being aware of the theoretical framework behind a study is important. Easterby-Smith et al. (1997) have identified several ways in which a theoretical framework can help in identifying a particular research methodology: it helps to identify the type of evidence to be gathered and its origin, the way in which such evidence is interpreted and how it helps to answer the research questions; it helps the researcher to evaluate different methodologies. In this study, factors that affect

information-seeking behaviour as outlined in Wilson's (1996) model of information behaviour were taken into consideration in deciding which research methodology to use.

There are four major schools of thought about knowledge claims (Creswell, 2003; Pickard, 2007); namely, positivism, constructivism, pragmatism, and post-positivism. Positivism believes that there is a single reality. In positivism, the researcher acts as a witness on the truth that is discovered. This approach of enquiry is associated with quantitative research (Pickard, 2007). Post-positivism involves theory verification, which means that the researcher starts his/her study with a theory. The researcher gathers data that either support or reject the theory before implanting it. The strategy of inquiry associated with this school of thought is the quantitative research method (Creswell, 2003). According to Creswell (2003), the concern for pragmatists is to find out what works and what provides solutions to problems.

The constructivist school of thought is based on the conviction that individuals seek understanding of the world in which they live and work. The researcher asks open-ended questions so that he/she can build meaning out of a situation. The researcher aims to interpret the meanings others have about the world in order to generate a theory, rather than starting with a theory. This theoretical framework is associated with a qualitative research approach in which interviews and observations are appropriate data collection methods (Creswell, 2003, p. 8).

Pragmatists believe that multiple paradigms can be used to address research problems. Bryant and Charmaz (2008, p. 609) state that pragmatism is an

'American philosophical tradition that views reality as characterised by indeterminacy and flexibility, and is open to multiple interpretations'. Pragmatism is considered as the foundation of the mixed-methods approach (Creswell, 2003).

Given the research aim, questions, and objectives as outlined in the Chapter 1, the researcher found pragmatism to be the appropriate way to approach this study as it allows the researcher to find real life answers to individuals' questions. This study was dealing with individual doctors who look at things from different angles. Therefore, the pragmatic approach helped to accommodate the participants with different worldviews. Although the participants were all doctors, they did not necessarily look at things in the same way. For example, some were gynaecologists, some paediatricians, others general medical doctors, etc. On the questionnaire, some participants indicated that they wanted to be interviewed, while others refrained from the interview, thus showing the different preferences of the doctors. Therefore, pragmatism accommodated the different preferences of the participants, which the exclusivity of positivism (quantitative only), post-positivism (quantitative only), and constructivism (qualitative only) would not be able to achieve. In addition, pragmatism supports the use of multiple methods such as using both qualitative and quantitative research methods in the same research (Tashakkori & Teddlie, 2003). As shown in the results, the qualitative information has been used to reflect on patterns found in the survey data.

The next section explains in more detail how the mixed-methods approach was used.

4.2.4 Mixed-methods approach

The most fitting research design for this study was the mixed-methods approach. A mixed-methods approach can be defined as the 'combining of different methods within the same study design' (Bloor, 2006, p. 116). A mixed methods approach involves collecting, analysing, and mixing qualitative and quantitative data in a single study. It is premised on the idea that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone (Creswell, 2003).

This study aimed to answer the main research question, 'What are the information needs and information-seeking behaviours of practising medical doctors at Katutura and Windhoek Central state hospitals?' The study was guided by the following research objectives, as outlined in Chapter 1:

- To identify the information needs of doctors at Katutura and Windhoek Central state hospitals;

- To find out how practising medical doctors at Katutura and Windhoek Central state hospitals seek information;

- To identify the information sources used by practising medical doctors at Katutura and Windhoek Central state hospitals;

- To identify factors affecting practising medical doctors at Katutura and Windhoek Central state hospitals in accessing and acquiring information for their medical practice;

- To find out how health information service provision may be improved; and

- To develop conceptual models of information seeking for medical doctors at Katutura and Windhoek Central state hospitals.

In this study, a qualitative approach was used to understand doctors' perceptions and to explore their information needs in different scenarios and contexts. The researcher also endeavoured to explore the information-seeking behaviour of practising medical doctors and investigate what, where, when, how, and why they seek information. All these factors are best investigated using a qualitative approach since it offers richly descriptive reports of individuals' perceptions, attitudes, beliefs, views, and feelings (Hakim, 1997).

The quantitative research approach contrasts with the qualitative approach in that it emphasises the collecting of words, actions, and records numerically. By collecting and analysing numbers rather than words, it supports a deductive approach in which emphasis is placed on the testing of theories. In this research, the researcher needed to examine and compare different clinical scenarios, different information sources, different categories of participants, and different locations.

A mixed-methods approach was chosen for this study to combine the benefits of both the quantitative and qualitative methods. Morse (2005) states that mixed-methods research 'consists of designs that are either primarily qualitative or quantitative and that incorporate strategies of other methods into the same research project'.

There are several advantages to the mixed-methods approach. The mixed-methods approach offers strengths that offset the weaknesses of quantitative and qualitative research methods when separately applied, as discussed under Subsection 4.2.4. It helps to answer questions that quantitative or qualitative methods alone cannot answer. Mixed-methods research encourages the use of multiple worldviews and is practical in nature. This type of research is important today because of the increased interest in qualitative research and the practical need to gather multiple forms of data for diverse audiences.

The approach helps to address different aspects of the same research questionnaire, thereby extending the breadth of the study. The mixed-methods approach therefore allows the researcher to draw on the unique strengths of each, thus providing both 'macro and micro level perspectives in a single project' (Gorman & Clayton 2005). According to Reams and Twale (2008) mixed-methods approaches have the following benefits: they enhance the corroboration of the data, they reduce bias, and they provide a more accurate conclusion.

Although mixed-methods are a valuable approach, there are some uncertainties in making analytical sense of the data collected. Tashakkori and Teddlie (2003)

point out that the disadvantages of using the mixed-methods approach are that it requires training in using both methods, it entails a high cost, and it requires researchers to work in multiple teams. The researcher managed to deal with these challenges because he had attended workshops offered by the University of Namibia and acquired the necessary skills. He managed to cut the costs by recruiting two research assistants to distribute the questionnaires while he concentrated on telephonic interviews with the participants. Despite these challenges, triangulation helped to view the research problem from different perspectives, hence its choice for this study.

4.3   Population and sampling

Below is a detailed discussion of the population of the study and the sampling procedure.
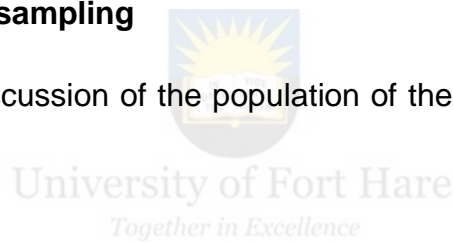
4.3.1   Population

Welman, Kruger, and Mitchell (2005, p. 52) define a population as the 'study object and consists of individuals, groups, organisations, humans, products and events, or the conditions to which they are exposed' and that it encompasses 'the total collection of all units of analysis about which the researcher wishes to make specific conclusions'.

The target population of this study was all the practising medical doctors working at Katutura and Windhoek Central state hospitals, approximately 140. This number excludes nurses and medical students, who make up a larger proportion of health staff at Katutura hospital. The researcher chose doctors rather than

other health care providers because clinical decision-making forms a large part of doctors' work than with other health professionals. Medical students were excluded from the study because their purpose is to receive training and their information requirements would be different from those of the practising doctors in the hospitals, as shown in Brennan et al.'s (2014) study and that of Nyam et al. (2015).

The selected doctors were working in a government hospital setting. The researcher chose the hospital setting rather than a primary care setting and also government rather than private practice for several reasons. First, there are few studies in the literature conducted to investigate the information needs and information seeking of practising medical doctors in hospital settings. Furthermore, in Namibia, there have been no studies exploring the information needs and information-seeking behaviour of doctors working in Namibian hospitals. The second reason is that the Healthcare Information System is still under construction in Namibia's government hospitals and doctors are important end-users of the current system. Government hospitals handle the high-risk cases. It is therefore important to focus on this sector to improve the services and provide high quality of care for the more difficult cases. The facilities and equipment in state hospitals are more developed than in the private sector. Information seeking in the hospital setting is worth investigating because in this environment, which is enriched by several contextual factors, the researcher can investigate different clinical scenarios of doctors' information seeking.

The researcher chose Katutura and Windhoek Central state hospitals because they serve as referral hospitals. Patients from all the 14 regions of Namibia are referred to the two hospitals. As general referral hospitals, they are large and contain several specialist doctors, which is not the case in smaller hospitals in the country.

4.3.2 Sampling

The total enumeration sampling procedure was used. Total enumeration sampling is a type of purposive sampling technique whereby the researcher examines the entire population that has a particular set of characteristics. The sample for this study was therefore all the 140 doctors working at Windhoek Central and Katutura state hospitals.

There are disadvantages and advantages in using total enumeration sampling. These are discussed below:

4.3.2.1 Disadvantages of total enumeration sampling

As with probability sampling techniques that require the researcher to obtain a list of the population, total enumeration sampling also requires the researcher to obtain such a list. For this study, it was not easy to get the lists of all medical doctors in the two hospitals, especially from Katutura State Hospital, even after obtaining authorisation from the hospital authorities. The human resource practitioners at Katutura State Hospital gave an estimated number of doctors working in this hospital, approximately 60. The assistant librarian had to come up with her own list of the doctors, which was not easy as doctors do not stay at

the hospital and they do not come to work at the same time. Therefore, the exercise was time-consuming.

If the list of the population is incomplete or if a large part of the members chooses not to take part in the research, the ability of the total population sample to allow the researcher to make analytical generalisations can be severely compromised. Fortunately, the HR department at Windhoek Central Hospital provided a list of all the doctors (80), some of whom were also working at Katutura State Hospital at the time of the study.

4.3.2.2   Advantages of total enumeration sampling

Since total enumeration sampling involves all members of the population, it is possible to get deep insights into the issues that the researcher is investigating. With such broad coverage of the population, there is also a reduced risk of missing potential insights from members that are not included (Lund Research Ltd., 2012). While total enumeration sampling is a purposive sampling technique, it is not possible to make statistical generalisations about the sample being studied. However, the use of total enumeration sampling does make it possible to make analytical generalisations about the population being studied (Lund Research Ltd., 2012).

In terms of the interviews, convenience and quota sampling were used, as discussed under Subsection 4.5.2 (Qualitative data collection). This is because the interviewees were drawn from the questionnaire participants.

Below is a discussion of the techniques used in the collection of data.

4.4 Data collection techniques

Two data collection instruments were used in this study: a questionnaire (quantitative) and an interview guide (qualitative). Interviews were used because they allowed the researcher to gain a more in-depth and fuller understanding of the feelings and attitudes of practising medical doctors at Katutura and Windhoek Central state hospitals. The respondents were not limited; they could use their own words to describe their situation. A questionnaire was also used to collect data from doctors in the two hospitals. The development of the questionnaire was guided by concepts found in Wilson's Information Behaviour model (1996). Wilson's model begins with the 'person-in-context'. The context can be the person himself or herself, or the role that the person plays in work, life, or the environment. Intervening variables such as psychological factors, demographic background, and factors related to one's social role, environmental and information source characteristics can either motivate or hinder information seeking. The risk or reward involved may lead to active or passive information-seeking behaviour. The information obtained is then processed and becomes an item of the user's knowledge, and is used directly or indirectly to influence the environment.

4.4.1 Quantitative data collection (questionnaire)

The first stage of the data collection process was a self-administered, semi-structured paper-based questionnaire (Appendix 6) used to collect quantitative data. The data collection at this stage is explained in more detail in the next subsection.

4.4.1.1   Rationale for using a questionnaire

The questionnaire was the first instrument used in this study for data collection. According to Smith (2008), well-prepared questionnaires can obtain data that describe reality and elicit the information that is required. Investigating the attitudes, beliefs, and opinions that groups of subjects with common traits hold is of value because it is assumed that these attitudes will influence behaviour. Research on attitudes, opinions, and beliefs can help to understand tendencies.

Some significant challenges with a questionnaire include low response rate, self-selecting bias, complex questions leading to confusion, lack of opportunity to clarify issues, and the fact that levels of truthfulness cannot be measured but only assumed (Kumar, 1999). To overcome these challenges, the questionnaire was professionally and carefully worded to enhance face validity. In addition, only one questionnaire was designed to collect data on information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals. Concepts from Wilson's (1996) Information Behaviour Model were considered in the designing of the questionnaire.

The questionnaire consisted of both open-ended and closed questions. Open-ended questions allow respondents to answer in any way they wish, without prompting. The disadvantage of open-ended questions is that because answers vary greatly, tabulating them may be time-consuming.

Closed questions are easy to code as they give the respondents the chance to choose from two or more fixed alternatives. Their main disadvantage is that they create artificially forced choices and rule out the possibility of unexpected

responses by the participants. Smith (2008) says, 'Sometimes the answers may not be correct. This may be caused by the fact that "I do not know" is generally not offered as an answer choice' (p. 235). Most closed questions use scaling to ensure uniformity in response, and one of the most widely used scales are the Likert scales.

In order to address some of the disadvantages associated with questionnaires, the researcher took a number of actions. First, the researcher wrote a covering letter explaining the reasons, importance, and benefits of the study, which include satisfying the information needs of practising medical doctors at Katutura and Windhoek Central state hospitals. The researcher then requested the phone numbers of the doctors for follow up purposes. The covering letter stressed the confidentiality of the information obtained, and that the names and phone numbers of the doctors who would like to be interviewed would be treated confidentially (see Appendix 5). All the questionnaires were hand delivered. Some were completed in the presence of the assistant researchers. The researcher also provided his cell phone number and e-mail address in the covering letter so that participants could seek clarification when the need arose. Clear instructions and an attractive layout for the questionnaire were developed. For example, bold, italicised, and uppercase text formats were used for instruction statements to make them clearer and more attractive. Informed consent was provided with the questionnaire so that the respondents would participate in the research freely without feeling pressured or deceived in any way. The whole population was included to improve the response rate.

4.4.1.2   Questionnaire design

In this study, both open-ended and closed questions were used (see Appendix 6). The questionnaire was intended to establish the information needs and the information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals. The questionnaire consisted of six sections (A to F) with a total of seventeen closed questions and one open-ended question. The aim of Section A was to collect the demographic data of the doctors such as age, gender, area of specialty, length of service, and level of education. Section B collected data on information needs and information-seeking behaviour of practising medical doctors. The respondents were given a list of specific choices with the 'Other' category if their responses did not fit within the specified categories. Section C collected data on the information-seeking behaviour of practising medical doctors. Section D collected data on information resources used by practising medical doctors at Katutura and Windhoek Central hospitals. Section E collected data on factors affecting medical doctors' information-seeking behaviour. The last question (Section F) was an open-ended question aimed at collecting data on ways of helping doctors with better medical information service.

The process of the questionnaire design followed five steps obtained from Frazer and Lawley (2000).

Step one: Determine the required information and from whom it should be sought.

The information used to design the questionnaire was derived from the research aim, research objectives, and research questions. Information was also derived from the reviewed literature. The population and sample were also considered. Only Katutura and Windhoek Central state hospitals were selected out of the possible thirty-five state hospitals in Namibia. The whole population of the medical doctors in the two hospitals was selected as the sample set because the researcher found it difficult to collect lists of doctors before the commencement of the research. The researcher decided to distribute the questionnaire to all of the doctors in the two hospitals to encourage a sizeable response. The total size of the population in this study was 140 doctors.

Step two: Determine the questionnaire method and the length of the questionnaire.

After deciding on the information to be collected, the next step is choosing an appropriate type of questionnaire. This can be mail, personally administered, telephone, or Internet. The paper-based questionnaire used in this study was self-administered by the respondents. The questionnaire had simple questions and clear instructions related to the research aim, objectives, and research questions.

Step three: Prepare draft questionnaire

This step has three components, namely, question content, question wording, and response format. The question content was determined by the information needs identified in Step One. Each section of the questionnaire was developed

by referring to various resources such as the research aim, research objectives and literature from previous studies that had adopted a questionnaire approach. Another critical component in drafting a questionnaire is question wording. The researcher ensured that each question in the questionnaire is linked to the study purpose, and excluded any unfamiliar terms and concepts. The third critical component that was taken into consideration in questionnaire drafting was the response format. The main concern for the selection of the response format is the data analysis method, which may identify a particular type of measurement, e.g. nominal, ordinal, interval, or ratio (Frazer & Lawley, 2000).

Three types of response format were used in the drafting of the questionnaire including open-ended questions. Open-ended question items provide a frame for the respondent to answer without any restrictions. In other words, they allow the respondents to write and explain their responses without limitation. Their inclusion in any questionnaire is critical because they cater for any lack of exhaustiveness and bias that might be found in closed questions. Most of the response categories ended with 'Other' to allow the respondents to express themselves further. The limitation of this type of response format is that the respondents may choose to write a lengthy or short discussion. The other issue relates to clarity of handwriting, which may be difficult to read. In addition, analysing open-ended answers is done manually, which can be time-consuming.

Closed questions were another format used in the questionnaire. The closed response format helps in improving the response rate. Responses obtained from this type of format can be ready for analysis and respondents can recognise a

response rather than remember it. Few questions had this format of response because this research was exploratory in nature.

The third format was scaled-response. This is useful where information is difficult to qualify. It is easy to use, and items can be reworded to check reliability. There is possible response bias to influence results (Frazer & Lawley, 2000). This is the weakness of questionnaires, which is however corrected by the use of interviews. Four-point Likert scales were widely used in designing the questionnaire. Likert scales are widely used for attitude scaling. A Likert scale measures the extent to which a person agrees or disagrees with the question. The most common scale is 1 to 5. Often, the scale would be 1=strongly disagree, 2=disagree, 3=not sure, 4=agree, and 5=strongly agree. In this study, the scale allowed respondents to respond in one of the following ways: 1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree, or 3=very often, 2=often, 1=not often, 0=not at all (Bell, 2005, p. 219). The researcher opted for fewer categories to make reply categories simple and not to confuse the participants.

In this step, the structure and layout of the questionnaire was determined. The researcher started with a brief introduction to provide clear and simple instruction, also bearing in mind that a well-structured questionnaire would motivate the respondents to complete it. The questions were asked without ambiguity or bias and avoided the use of technical words. A readable font size (Arial font, size 12) was used for the questions. Italics and bold were used to emphasise key words and instructions, answer boxes were large enough to write in and the questions fitted the pages. Sections were numbered A, B, and C with

134

exploratory section headings, and questions were numbered A1, A2, etc. English language was used to formulate the questions, as it is the study medium of Namibian education and the most common practical language in the field of medicine.

Step four: Pre-test and revise the questionnaire

The pre-test questionnaire or pilot study helps the researcher to reveal any uncertainty, which can then be corrected. It helps in measuring the length of time required for the completing the questionnaire. In order to test the reliability of these research instruments, a pilot study was carried out before the actual study commenced. The testing of the research instruments was an important step in carrying out this study in order to identify deficiencies in the questionnaire and the interview guide and get ideas for improving them. This provides the questionnaire, as a research instrument, with greater validity (Smith, 2008, p. 236).

The sample size for the pilot study was five practising medical doctors at Engela Hospital. The final comments received from the pilot study were used to reword and finalise the structure of the final research instruments.

Step five: Assess the reliability and validity of the questionnaire

Reliability refers to the extent to which a scale produces consistent findings if repeated measurements are made on the characteristics (Welman, Kruger, & Mitchell, 2005, p. 145). This means that two researchers using the same participants and the same instruments will get the same findings.

An instrument does not only need to be reliable, but also to be valid. Black (1999) notes that, 'the validity of a scale is the extent to which it captures all aspects of the construct to be measured' (p. 35), In other words, validity refers to the extent to which a measuring instrument measures what it is intended to measure. Thus, validity is not about the measuring instrument itself but the measuring instrument in relation to the purpose for which it is being used.

Validity can be tested through content validation, construct validation, criterion validation, and face validation (Black, 1999, pp. 193-194). Construct validity is a type of measurement validity that uses multiple indicators and has two subtypes: how well indicators of one construct converge or how well indicators of different constructs diverge (Neuman, 2011, p. 193).

Reliability is defined by Korb (2013) as the consistency of results from a test. There are three major categories of reliability for most instruments. (1) The test-retest method measures error because of changes over time. The same instrument is given twice to the same group of people. (2) The equivalent-form method, measures error because of differences in test forms. Two different versions of the instrument are created and the same research participants complete both instruments during the same period. Scores on the two instruments are linked to calculate the consistency between the two forms of the instrument. (3) The internal-consistency method measures error because of idiosyncrasies of the test items. Several methods exist that can be used to calculate internal consistency of an instrument. Korb (2013) gives the following examples of internal consistency calculation methods: (a) Split-Half – when

136

using this method, a total score for odd number questions is linked with a total score for even number questions. This is often used with dichotomous variables that are scored '0' for incorrect and '1' for correct; (b) the Spearman-Brown prophecy formula is applied to the correlation to determine the reliability; (c) Kuder-Richardson Formula 20 (K-R 20) and Kuder-Richardson Formula 21 (K-R 21) – these are alternative formulas for calculating how consistent subject responses are among the questions on an instrument. Items on the instrument must be dichotomously scored. All items are compared with each other, rather than half of the items with the other half of the items; and (d) Cronbach's Alpha – this is used to measure internal consistency when the items on an instrument are not scored right versus wrong, especially in the case of attitude scales such as Likert. SPSS is normally used to calculate Cronbach's alpha (Korb, 2013).

To ascertain the reliability level of the questionnaire for this study, Cronbach's alpha was used. Korb states the following ratings for Cronbach's alpha reliability statistics:

.50-.60 = marginal

.61-.70 = good

.71-.85 = very good

Fraenkel and Wallen (2000) have argued that a useful rule of thumb is that the reliability should be at least .70.

4.4.1.3   Validity test

In this study, pilot testing of research instruments was done to test content validity. The instruments were pilot tested using five practising medical doctors from Engela Hospital in Ohangwena Region, Namibia. One of the suggestions from these doctors was for the researcher to add 'medical database' as a source of information. Construct validity for this study was ensured by using concepts in Wilson's Information Behaviour model in the designing of the questionnaire. Criterion validity is a measurement validity that relies on some independent, outside verification (Simon & Burstein, 1985, p. 210). In this study, the design of the research instruments was based on Wilson's (1999) theory.

4.4.1.4   Reliability test

The following tables show the reliability statistics of applicable sections of the questionnaire based on the results as produced by IBM SPSS (Version 25).

Reliability test for information needs

Question: Which of the following information needs apply to you in relation to your work as a medical practitioner? (Tick all that apply to you).

Table 4.1 Reliability statistics for information needs

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.886	.890	10

The alpha coefficient for the 10 items is .886, suggesting that the items have high internal consistency.

Reliability test for information-seeking behaviour – resources

Question: What type of information resources do you use in your hospital when you need information? (Please tick all that apply to you)

Table 4.2 Reliability statistics for information-seeking behaviour - resources

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.703	.710	9

The alpha coefficient for information behaviour with regard to information resources used is .703, suggesting that the items have a high internal consistency.

Reliability test for factors affecting information-seeking behaviour

Question: Which of the following have been problems for you in obtaining the information you need? (Please tick all that apply)

Table 4.3 Reliability statistics for factors affecting information-seeking behaviour

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.735	.735	17

The alpha coefficient for factors affecting behaviour is .735, suggesting that the items have high internal consistency.

Reliability test for degree of satisfaction with information resources and services

Question: Please indicate your degree of satisfaction in using the following information resources, services and other activities for gathering information.

Table 4.4 Reliability statistics for degree of satisfaction with information resources and services

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.779	.792	10

The alpha coefficient for degree of satisfaction with information resources and services is .779, suggesting that the items have relatively high internal consistency.

4.4.2   Qualitative data collection (interviews)

After the researcher had collected the questionnaires, follow-up interviews were held with 20 participants who had indicated in their questionnaires that they were willing to be interviewed. The follow-up interviews helped to answer the "why" questions emanating from the questionnaire. Therefore, the researcher deemed the interviews necessary to strengthen and explain the quantitative findings.

An interview guide was used because it makes the interviewing systematic and comprehensive and keeps the interview focused. The interviews were conducted cell-phonically with participants who had indicated willingness to do so after answering the questionnaire. The interview guide for this study (see Appendix 7) was designed in such a way that it addressed the following:

- information needs and information-seeking behaviour of practising medical doctors;

- information sources used and how they are used;

- factors affecting doctors' information-seeking behaviour; and

- a framework for medical information services.

Interviews were chosen as the second technique for gathering data in this study because the researcher was looking for in-depth details on issues that were

raised or not covered in the questionnaire. According to Bertrand and Hughes (2005), interviews are an appropriate method to get qualitative and descriptive in-depth data. Interviews provide an insight into what the interviewee sees as relevant, which allows the researcher to explore participants' opinions. The interview is a flexible method that allows the interviewer to adapt any schedule or guide that is being used. Interviews allow participants to respond on their own terms and within their own linguistic parameters, providing them and the interviewer with the opportunity to clarify meanings and share understanding (Bertrand & Hughes, 2005).

Interviews have some disadvantages though. For example, they are expensive; conducting one-to-one interviews consumes a large amount of research time, both in their implementation and in their recording, if written transcription is needed (Gorman & Clayton, 2005); sorting important points from a large quantity of data can be difficult; and they are too personal by nature, which becomes difficult if one is dealing with sensitive issues.

4.4.2.1   Type of interview chosen for the study

The researcher chose a semi-structured cell-phone type of interview, having considered some important factors: 1) The nature of the research and the sort of data needed to respond to the research questions; 2) The researcher was looking for in-depth and detailed data, which could be gathered by using semi-structured interviews. In semi-structured interviews, the researcher prepares a list of questions in advance; and 3) time constraints and cost. The cell-phone

interviews saved time, as the researcher was able to collect data from a remote area, which also helped to save travel costs.

4.4.2.2   Interview sampling

Convenience sampling and quota sampling were combined to select participants for the interviews. Fink (2003) explains that quota sampling divides the study population into subgroups, such as by gender or age and subsequently, the researcher estimates the proportion of participants in each subgroup. This method was chosen for various reasons. First, the population elements were selected on the basis of their availability, that is, because they volunteered. Second, the researcher arranged the participants into two categories based on the respective hospital where they were working (either Katutura or Windhoek Central). The researcher then purposively selected from the list of volunteers (20) those who had appropriate characteristics that reflected the research aim, research objectives, and research questions, based on their responses to the questionnaire. This method was appropriate for the researcher's situation in terms of time, geographical location, and the accessibility of the participants.

4.4.2.3   Designing of the interview guide

The interview guide consisted of three main sections (Appendix 7), in line with the objectives of the study. The first was the introductory part, which included a welcome statement, an icebreaker, and a review of the purpose of the research. The second section included the four principal topics to be covered in the interview, namely, doctors' information needs for medical practice; use of health information sources; problems in obtaining information needed for medical

practice; and suggestions for improving information provision at Katutura and Windhoek Central state hospitals.

The interview concluded by asking the participants if they would like to discuss any issues related to the interview subject, and ended with a 'Thank you' statement.

4.5 Research procedure

On 14 December 2015, the researcher visited Katutura and Windhoek Central hospitals and presented to the hospital superintendents a letter of authorisation from the Ministry of Health and Social Services (Appendix 2) as well as the certificate of ethical clearance from the University of Fort Hare (Appendix 1).

On 12 January 2016, the assistant researcher (Ms. Frieda Lukileni) started the distribution of questionnaires to medical doctors at Katutura Hospital. She started by inviting all doctors serving at Katutura Hospital to the hospital library where she created a name list and distributed 60 questionnaires, and 42 (70.0%) responded. Two main factors affected the response rate from Katutura Hospital. Upon analysing the questionnaires, the researcher discovered that 20 of the questionnaires from Katutura Hospital had been completed by medical students. The researcher later withdrew these from the study because the focus of the study was on practising medical doctors (see 'Delimitations' under Section 1.14). In addition, eight of the questionnaires were incomplete and were therefore rendered 'spoilt'. The 28 questionnaires (20 completed by medical students and 8 spoilt) were therefore withdrawn, leaving only 14 valid questionnaires from Katutura Hospital.

At Windhoek Central Hospital, the research assistant (Mrs. Lorna Newman) distributed 80 questionnaires to the heads of sections to distribute to the doctors, and 57 (71.3%) responded. The participants and the human resource (HR) practitioners at Windhoek Central Hospital were very cooperative. They provided the research assistant with a list of 80 names of medical doctors working in the hospital. This was not the case with Katutura Hospital, where HR officers refused to give a list of names of medical doctors working at the hospital.

In total, 140 questionnaires were distributed and 122 (87.1%) participants responded. The researcher also discovered that 10 doctors indicated that they worked at both Katutura Hospital and Windhoek Central Hospital. In total, therefore, Windhoek Central Hospital had 57 respondents and Katutura State Hospital had 14 respondents, bringing the number of participating doctors to 71. The majority of qualified doctors who participated in the study were therefore from Windhoek Central Hospital. Table 4.1 shows the questionnaire response rate, with an overall high response rate of 70.7%. Of the 99 responses, 71 (71.7%) were valid, while 28 (28.3%) were invalid because some of respondents were students and some questionnaires were incomplete. It should be noted that the lists of doctors from the two hospitals did not distinguish between students and practising doctors, hence the mix-up, which contributed to the 28.3% invalid responses.

Table 4.5: Questionnaire distribution and response rate

Hospital	Distributed questionnaires	Non-responses	Responses	Valid responses (% of responses)	Invalid responses (% of responses)	Reason for invalid
Katutura	60 (100.0%)	18 (30.0%)	42 (70.0%)	**14 (33.3%)**	28 (66.7%)	20 respondents were medical students and 8 questionnaires were incomplete
Windhoek	80 (100.0%)	23 (28.7%)	57 (71.3%)	**57 (100.0%)**	0 (0.0%)	
Both				*[10]		
Total	**140 (100.0%)**	41 (29.3%)	**99 (70.7%)**	**71 (71.7%)**	28 (28.3%)	20 respondents were medical students and 8 questionnaires were incomplete

*Ten of the respondents indicated that they were working in both hospitals.

Some respondents who worked at both hospitals may have felt limited to only one of the two hospital choices. However, although the statistical reporting in this study may refer to the two hospitals here and there, it should be noted that the purpose of the study was not to compare the two hospitals, but to focus on the information needs of practising medical doctors in the two major hospitals in

Namibia, combined. The division of statistics by hospital therefore is for administrative purposes only, except in a few cases, for example where respondents indicated that resources available at one hospital were different from the ones at the other. The 'Total' figures in the results are therefore more important in this study than the hospital- (or 'Workplace')-related figures.

4.6 Data analysis

Data analysis is about how the researcher arranges and presents the findings of the study. The main reason for analysing data is so that the unordered data are converted into meaningful information. IBM SPSS Version 25 was used to organise and analyse quantitative data collected through the questionnaire. SPSS is a computer-based programme that is used to organise and analyse statistical data. Qualitative data from the interviews were analysed using content analysis.

4.6.1 Analysis of quantitative data

To ensure high quality of the data collected, a process of data evaluation was carried out. This involved going through all the questionnaires and questions, checking for errors in the responses and verifying them with the respondents, where possible. All questionnaires were numbered to enable the cross checking of data entry in the IBM SPSS (Version 25) application.

In analysing the quantitative data, the researcher used a number of variables. A variable is a concept that varies (Neuman, 2011, p. 160). Variables can be classified into three broad types, namely, attributes, behaviour, and opinions.

147

Attribute variables are concerned with characteristics such as age, sex, marital status, education, etc. Behaviour variables are concerned with questions such as 'what?', 'when?', and 'how often?' Opinion variables are concerned with the respondent's point of view, such as 'why?' (Neuman, 2011, p. 160).

One of the main aims of quantitative research in social sciences is the demonstration of causality. This, in other words, is to find out the effect of one variable upon another. The terms 'independent variable' and 'dependent variable' are often employed in this context. The independent variable denotes a variable that has an effect upon the dependent variable. In addition, when researchers are not able to actually control and manipulate an independent variable, it is technically referred to as a status variable (Neuman, 2011, p. 161).

In conducting this study, various independent variables (age, gender, place of work, department, job title, level of education, work experience, and experience at the current hospital) were considered. However, there were no major correlations between the independent variables and the dependent variables. The dependent variables that were considered included perceived information needs, information-seeking behaviour, and use of various information sources and resources. These data were then exported onto the IBM SPSS (Version 25) programme for analysis.

4.6.2   Analysis of qualitative data

According to Struwig and Stead (2001), content analysis is 'the gathering and analysis of textual content' (p. 11). The content refers to words, meanings, pictures, symbols, ideas, themes, or any message that can be communicated

(Neuman, 2011, p. 322). The aim of content analysis is to transform and classify words so that links can be made between causes and effects. Content analysis has been used to analyse bias in news reporting, the content of newspapers, the extent of sexual or racial stereotypes in textbooks, the differences in black and white popular song lyrics and the nationalist bias in history textbooks (Bell, 2005, p. 128).

In this study, open-ended responses in the questionnaires (qualitative responses) were content analysed in the light of the quantitative responses. Content analysis was used in these sections as the researcher found it to be the most suitable in analysing the open-ended responses in the questionnaire. Qualitative findings from the interviews were also analysed alongside the results of the questionnaires to help with clarity and to strengthen the understanding of the findings. It should be remembered that the interviews were conducted telephonically with a portion of the same respondents who had completed the questionnaire. The purpose of the qualitative study was therefore to clarify and strengthen the quantitative findings.

4.7   Ethical considerations

Neuman (2011, p. 131) points out that, because of the possible negative effects of research on those being studied, there is a need to respect the research participants and sites. Research ethics provide the researcher with a code of moral guidelines on how to conduct research in a morally acceptable way. It involves getting the informed consent of the participants and reaching

agreements about the use of these data and how their analysis will be reported and disseminated (Gillespie, 2008, p. 46).

Ethical standards are based on 'lessons learned through the history of research and on the experiences of professionals with the goal of minimising risk to research participants', hence, they should 'be the foundation for ethical decision-making in research; wisdom and attention to detail complete the process' (Lapan & Quartaroli, 2009, p. 296).

It is in the light of the above that a letter of introduction and approval to conduct the research (Appendix 1) was sought from Fort Hare University's Research Ethics Committee before embarking on the study. The letter served not only to introduce the researcher but also to introduce the subject of the study to the participants. A consent form (Appendix 5) was also sent out and the respondents were asked to indicate their willingness to participate in the survey.

In the analysis and interpretation of both qualitative and quantitative data, issues of good ethics are also considered and these include:

- Protecting the anonymity of individuals;

- Discarding data after a given period so that it does not fall into the wrong hands; and

- Providing an accurate account of the analysed data.

In this study, the research assistants took time to explain the research to the participants as explained in the data collection protocol (see Appendix 3). This

was done so that participants could make an informed decision on whether to take part or not (Denzin & Lincoln 2000, p. 138). The participants were asked to read and sign an informed consent form (Appendix 5) and were given the option not to participate if they did not wish to do so. The participants were also asked not to write their names on the questionnaire.

4.8   Demographic details of participants

This study used Wilson's (1996) model of information needs and information-seeking behaviour as a framework to establish the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals. The demographic information presented under this section shows the diversity and multiplicity of the contexts of the participating doctors. It should be noted that in this study, very few significant correlations were found between these demographic variables and the dependent variables.

4.8.1   Gender

Table 4.6: Gender of participants (N = 71)

Gender	N	%
Male	31	43.7%
Female	40	56.3%
Total	**71**	**100.0%**

Table 4.6 shows that although females were slightly more than males, gender representation was reasonably fair (females = 56.3%; males = 43.7%). Although

gender was not used as a major factor in determining the information needs and behaviour of medical doctors in this study, it is important that both sexes were almost equally represented. Notwithstanding the doctors who did not opt to participate in the study, this statistic seems to suggest that there are more female qualified medical doctors than males in Namibia's major hospitals. A study done by Mckinstry (2008) found that universities in the United Kingdom, Canada, and Australia are producing more female doctors than male. It seems that there is a trend of more women joining the medical field than previously.

4.8.2   Age

Table 4.7: Age of participants (N = 71)

		Male		Female		Total	
		Count	%	Count	%	Count	%
Age range	Below 31	3	4.2%	15	21.1%	18	25.4%
	31-40	15	21.1%	18	25.4%	33	46.5%
	41-50	7	9.9%	1	1.4%	8	11.3%
	51-60	2	2.8%	4	5.6%	6	8.5%
	Over 61	4	5.6%	2	2.8%	6	8.5%
	Total	**31**	**43.7%**	**40**	**56.3%**	**71**	**100.0%**

The majority of respondents (46.5%) were within the 31-40 years age range, followed by those who were below 31 years of age (25.4%). Namibia recently introduced a training school for medical doctors in 2010. This has resulted in a

number of young graduates serving in government hospitals. This could have contributed to the high number of younger medical doctors in the two hospitals. A study by Peck (2011) found that doctors interact with patients differently depending on age. There are a few places in this study, where age played a role in the information needs and seeking behaviour of medical doctors (see Subsections 6.4.11 and 6.4.12).

4.8.3 Nationality

Table 4.8: Nationality of participants (N = 71)

		Male		Female		Total	
		Count	%	Count	%	Count	%
Nationality	Namibian	8	11.3%	32	45.1%	40	56.3%
	Non Namibian	23	32.4%	8	11.3%	31	43.7%

It is noteworthy that both Namibian and non-Namibian doctors were highly represented in this study. The trend of foreign medical doctors is not new. The Research Consortium (2008) studied the trends of migration of medical doctors from 1999-2003. The trend was that in the earlier years, more doctors immigrated into South Africa than those who emigrated, while in the later years, the percentage of emigrating doctors exceeded that of the immigrating doctors (Research Consortium, 2008, pp. 19-20). It is therefore not surprising that doctors immigrate into Namibia from other parts of the world.

The existence of a high percentage of non-Namibian doctors in the participating

hospitals (43.7%) is important as it relates to language-barrier challenges that

were raised during the study (see Section 7.3.1), where some doctors were

struggling to communicate with their patients.

4.8.4   Department

The participating doctors were working in various departments in either one or

both hospitals. Fifteen departments were involved in this study. Table 4.9 shows

the departments where the doctors were working.

Table 4.9: Departments in which the doctors were working (N = 71)

		Male		Female		Total	
		Count	%	Count	%	Count	%
Department	General surgery	6	8.5%	1	1.4%	7	9.9%
	Internal medicine	5	7.0%	0	0.0%	5	7.0%
	Orthopaedics	2	2.8%	1	1.4%	3	4.2%
	Obstetrics Gynaecology	0	0.0%	0	0.0%	0	0.0%
	Urology	4	5.6%	2	2.8%	6	8.5%
	Paediatrics	3	4.2%	4	5.6%	7	9.9%
	Emergency/ Casualty/ICU	1	1.4%	6	8.5%	7	9.9%
	Oncology	1	1.4%	6	8.5%	7	9.9%
	Ophthalmology	1	1.4%	5	7.0%	6	8.5%
	Dermatology	2	2.8%	1	1.4%	3	4.2%
	Anaesthesiology	0	0.0%	4	5.6%	4	5.6%
	Neurology	1	1.4%	0	0.0%	1	1.4%

		Male		Female		Total	
		Count	%	Count	%	Count	%
	Cardiology	1	1.4%	3	4.2%	4	5.6%
	Psychiatry	1	1.4%	4	5.6%	5	7.0%
	ENT	2	2.8%	1	1.4%	3	4.2%
	Radiology	1	1.4%	0	0.0%	1	1.4%

Most respondents were working in the general surgery, paediatrics, emergency, and oncology. Very few were in the neurology and radiology departments. From Wilson's (1996) model, it would be expected that the department in which a medical doctor operates would be a contributing factor to their information needs and information-seeking behaviour, as the department gives the context in which the doctors are operating. This would fit within the person-in-context component of Wilson's model, which, among other factors, gives rise to information needs. However, no significant correlations emerged in this regard.

4.8.5 Level of education

Table 4.10: Highest level education of respondents *(N = 71)*

		Male		Female		Total	
		Count	%	Count	%	Count	%
Highest education	Bachelor's	11	15.5%	30	42.3%	41	57.7%
	Master's	17	23.9%	5	7.0%	22	31.0%
	PhD	0	0.0%	1	1.4%	1	1.4%
	Post-Grad Diploma	1	1.4%	1	1.4%	2	2.8%
	Other International	1	1.4%	0	0.0%	1	1.4%

155

Overall, the majority of respondents had either Bachelor's degrees (57.7%) or Master's degrees (31.0%). Only one (1) respondent had a PhD. Four participants did not respond to this question. Some lay people have an impression that all medical doctors have doctoral degrees. One interviewee explained that in the medical field, the term 'doctor' is a title rather than a position or academic qualification.

4.8.6 Job title

Table 4.11: Job titles of respondents (N = 71)

		Male		Female		Total	
		Count	%	Count	%	Count	%
Job title	Consultant	4	5.6%	0	0.0%	4	5.6%
	Specialist	10	14.1%	5	7.0%	15	21.1%
	Senior Specialist	0	0.0%	0	0.0%	0	0.0%
	Registrar	3	4.2%	3	4.2%	6	8.5%
	Assistant registrar	0	0.0%	0	0.0%	0	0.0%
	Senior registrar	0	0.0%	0	0.0%	0	0.0%
	Trainee	0	0.0%	0	0.0%	0	0.0%
	Medical Officer	13	18.3%	30	42.3%	43	60.6%

Medical officers formed the majority (60.6%) of the respondents, while a significant number were specialists (21.1%). Three respondents did not answer this question. The researcher sought clarity from the interviewees with regard to these job titles. The interviewees explained as follows:

Medical Officer: This is the entry point after internship in the medical field. A medical officer is a doctor who has not specialised, also known as a general practitioner (GP). A medical officer is qualified to run his or her own practice and to be held accountable.

Registrar: A registrar is a qualified medical doctor who is training to become a specialist. Registrars work under consultants.

A specialist is one who has specialised in a particular field.

Consultants are medical officers with more experience, who handle difficult cases. Consultants have a supervisory role. It was clarified in the interviews that a specialist and a consultant are the same. Therefore, the result on 'Consultant' and 'Specialist' in Table 4.18 above should actually be combined. Therefore, 19 (26.8%) of the 71 participants were consultants/specialists. It is interesting, though that more consultants/specialists ticked 'Specialist' and very few of them ticked 'Consultant' on the questionnaire. This might be an indication that 'Specialist' is more common than 'Consultant'.

The above explanation is confirmed by the British Medical Association (2017), which gives detailed explanations of these medical titles.

It can be concluded that the two major hospitals in Namibia have a high number of Medical Officers and Specialists.

The above explanations may help to explain the significant moderate correlations found between job title and experience as medical doctor *(r = -.675, n = 67, = p < .01)* and between job title and experience on the current job *(r = -*

.504, n = 68, = p < .01) as shown in Table 4.12 below. The negative correlations are because of the way the job titles were arranged in the statistical dataset (ranging from the higher-level job, Consultant, to the entry-level job, Medical Officer). It is possible that the moderate significance could be because the title 'Medical Officer' is not only an entry-level title, but some medical officers with much experience may decide not to specialise.

Table 4.12: Correlations between job title and experience

		Job title	Experience as medical doctor	Experience on current job
Job title	Pearson Correlation	1	-.675[**]	-.504[**]
	Sig. (2-tailed)		.000	.000
	N	68	67	68
Experience as medical doctor	Pearson Correlation	-.675[**]	1	.580[**]
	Sig. (2-tailed)	.000		.000
	N	67	69	69
Experience on current job	Pearson Correlation	-.504[**]	.580[**]	1
	Sig. (2-tailed)	.000	.000	
	N	68	69	71

**. Correlation is significant at the 0.01 level (2-tailed).

4.8.7 Work experience as a medical doctor

Table 4.13: Respondents' period of experience as medical doctors

		Male		Female		Total	
		Count	%	Count	%	Count	%
Experience as medical doctor	Less than 1 year	0	0.0%	0	0.0%	0	0.0%
	1-5 years	7	9.9%	24	33.8%	31	43.7%
	6-10 years	8	11.3%	8	11.3%	16	22.5%
	11-15 years	6	8.5%	0	0.0%	6	8.5%
	16-20 years	1	1.4%	2	2.8%	3	4.2%
	More than 20 years	8	11.3%	5	7.0%	13	18.3%

Although there was quite a significant number of respondents who had more than 20 years of experience as medical doctors (18.3%), the highest percentage were in the 1-5 year range (43.7%). However, when the figures are combined, those who had more than 5 years of experience represented the majority (53.5%), compared to the 43.7% of those with 5 years and below. This shows that the respondents had been in the medical field for generally quite a long time. Two respondents (2.8%) did not answer this question.

4.8.8 Work experience at the hospital

Table 4.14: Respondents' period of work experience at current hospital

		Male		Female		Total	
		Count	%	Count	%	Count	%
Experience on current job	Less than 1 year	3	4.2%	2	2.8%	5	7.0%
	1-5 years	17	23.9%	29	40.8%	46	64.8%
	6-10 years	3	4.2%	5	7.0%	8	11.3%
	11-15 years	3	4.2%	0	0.0%	3	4.2%
	16-20 years	4	5.6%	3	4.2%	7	9.9%
	More than 20 years	1	1.4%	1	1.4%	2	2.8%

Although the respondents generally had vast experience in the medical field as indicated earlier (Table 4.13), their experience in their current workplace was slightly lower, with the majority having been working at their current hospital for 5 years or less (64.8%). This implies that most of the doctors had a diversity of work experience from different medical settings other than their current hospitals.

4.8.9 An analysis of the demographic information

Pearson's r was computed to analyse relationships among the demographic variables of the participants. In the explanation of correlations, 'r' represents correlation, 'n' represents number of participants, and 'p' represents the significance level.

It is noteworthy that there was evidence of a few significant correlations in some of the continuous demographic variables. Of note are the relationships between age, education, experience in the medical field, and experience at the current hospital. Table 4.15 below shows the correlations.

Table 4.15: Analysis of demographic data

		Age range	Highest education	Experience as medical doctor	Experience on current job
Age range	Pearson Correlation	1	.509**	.899**	.639**
	Sig. (2-tailed)		.000	.000	.000
	N	71	67	69	71
Highest education	Pearson Correlation	.509**	1	.599**	.167
	Sig. (2-tailed)	.000		.000	.177
	N	67	67	65	67
Experience as medical doctor	Pearson Correlation	.899**	.599**	1	.580**
	Sig. (2-tailed)	.000	.000		.000
	N	69	65	69	69
Experience on current job	Pearson Correlation	.639**	.167	.580**	1
	Sig. (2-tailed)	.000	.177	.000	
	N	71	67	69	71

**. Correlation is significant at the 0.01 level (2-tailed).

The evidence of a strong positive correlation of experience as medical doctors and age in this study ($r = .899, n = 69, p < .01$) is logical, as experience is gained over time. The relationship is therefore not a surprising finding. It is interesting, however, to note that although there was a positive correlation between experience as medical doctors and experience in the current hospital, the correlation is not very strong ($r = .580, n = 69, p < .01$). It makes sense, though,

that a person who has a lot of experience in the medical field can have less experience in a specific hospital. Therefore, the conclusion given under Subsection 4.8.8 that the participating doctors had a diversity of work experience from different medical settings other than their current hospitals explains this phenomenon. The positive correlation between age and experience in the current hospital was also significant ($r = .639, n = 71, p < .01$). This could be explained by the age versus experience logical conclusion made earlier in this paragraph.

4.9 Evaluation of the research methodology

Every research methodology has its strengths and weaknesses (Bell, 2005) and thus the researcher reasoned that a mixed-methods approach employing both qualitative and quantitative (triangulation) techniques would benefit this study. Triangulation gives the desired confidence, or what Struwig and Stead (2001, p. 100) refer to as reliability and validity, to a study. Struwig and Stead define reliability as 'the extent to which test scores are accurate, consistent or stable' (p. 130).

Quantitative research collects facts and studies the relationship of one set of facts with another, while qualitative research is concerned with understanding individuals' perceptions of the world around them (Bell, 2005, pp. 7-8). Triangulation was adopted for this study because the researcher was concerned about both facts and perceptions regarding practising medical doctors' information needs and information-seeking behaviour. Despite the few challenges cited about the mixed-methods research methodology, the

researcher found this methodology to be the most suitable for conducting this study because it is inexpensive and flexible. Several studies on information needs and information seeking conducted in the past (Mabhiza, 2016; Andualem et al., 2013; Cline & Luiz, 2013; Matsveru, 2013; Chiware & Dickson, 2008) have employed a similar methodology. In addition, the methodology allows for the use of a variety of data collection methods (qualitative and quantitative) which complement each other. Another advantage is that it allows for the selection of a small sample from a much larger population and the findings can be applied to the larger population. If another researcher were to conduct the same study, he/she would get the same results.

4.10 Conclusion

This chapter has outlined the methods and techniques that were used in investigating the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals.

A mixed-methods approach was chosen for this study because of its ability to enhance the corroboration of data, reduce bias and provide a more accurate conclusion. Total enumeration sampling was also used because it helped the researcher to get deep insights into the information needs and information seeking behaviour of medical doctors at Katutura and Windhoek central state hospitals as all doctors were given an opportunity to contribute their insights. A questionnaire and an interview guide were used as instruments to collect data. Interviews allowed the researcher to gain a more in-depth and fuller understanding of the feelings and attitudes of medical doctors at Katutura and

Windhoek Central state hospitals while the questionnaire helped to reach more respondents at the same time.

A computer-based statistical programme (IBM SPSS, Version 25) was used to analyse statistical data, while content analysis was use to analyse verbal data and written qualitative data.

The next four chapters present the findings from the questionnaire survey and interviews as well as the analysis and interpretation of those findings.

University of Fort Hare
Together in Excellence

CHAPTER 5: INFORMATION NEEDS OF PRACTISING MEDICAL DOCTORS AT KATUTURA AND WINDHOEK CENTRAL STATE HOSPITALS

5.1 Introduction

Even when doctors have medical knowledge, they still need to continuously search for information so that they keep up-to-date and/or expand their knowledge.

According to Case (2006), an information need refers to one's recognition that their personal knowledge is inadequate to satisfy a goal. With regard to the concept of information need, Wilson (1999) asserts that there must be a motivating factor for an individual to experience an information need. Wilson and Walsh (1996) note that at the root of the problem of an information-seeking behaviour is the concept of information need. In other words, the behaviour of an information user is influenced by the need for information. Kuhlthau (1993), suggests that an information need involves a vague awareness that something is missing for an individual to deal with or solve a problem at hand. For example, during their clinical practices, doctors may encounter newer forms and strains of diseases, strange symptoms, and unknown ailments, which can cause them to need information or engage in information seeking activities.

 A number of studies (Dervin & Nilan, 1986; Devadason & Lingam, 996) asserts that information needs represent gaps in the current knowledge of the user. The information needs may be articulated needs, unexpressed needs, or dormant needs (that is, an information need the user is unaware of).

Wilson (1999) emphasises that, usually, something motivates or pushes an individual to seek information. Wilson affirms that individuals may experience a need for new information, a need to expound information held, and a need to confirm information held. Doctors may need information to keep up-to-date with developments in areas of their specialisation, for improving clinical decision-making, for improving their knowledge, and for continuing education.

Wilson (1999) notes that *need* is a subjective experience that occurs only in the mind of the person in need and, therefore, is not directly accessible to an observer. He asserts that the experience of a need can only be discovered through the reports of the person in need. In designing data collection instruments for this current study, the researcher considered these sentiments; hence, the doctors were asked to write or narrate their information needs.

Wilson (2000) explains that information needs can be physiological, emotional or cognitive. Information may be needed to deal with the physical life of an individual; for instance, in the case of this study, doctors may need information on how to do a heart transplant. Information may also be needed to deal with the emotional aspects of an individual; for example, doctors may need information on how to deal with a patient who is experiencing a mental problem. Doctors may also need information for their personal cognitive growth. In his 1996 model, Wilson states that the contexts that may influence an information need could be the person himself/herself and the role the person plays at work, including factors such as the environment and characteristics of the information sources (Wilson, 1999).

The findings in this chapter are meant to address Objective 1 of this study, which was to identify the information needs of practising medical doctors at Katutura and Windhoek Central state hospitals.

5.2   Core argument of the chapter

The study has revealed that medical doctors need information primarily to enhance their clinical decision-making, to keep up-to-date, and to improve their professional knowledge/continue education. Keeping up-to-date and improving knowledge/continuing education are closely related. It seems from the results that satisfying these needs is likely to help doctors to satisfy the information need for improving clinical decision-making. The doctor's role and his/her personality influence their need for information. This study revealed that medical doctors might look for information to enhance their clinical decision-making or to keep up-to-date with what is going on in their areas of specialty. This finding is in line with Wilson's (1996) model of information seeking which regards the role that a person plays to be important in information seeking. Wilson's (1996) model of information-seeking behaviour upon which this study is anchored begins with the 'person-in-context', in which information needs arise. The information needs are seen as secondary needs arising from primary needs, which are of a physiological, cognitive or affective nature. In the case of this study, the person-in-context is the practising medical doctor who needs information for clinical decision-making, keeping up-to-date, and improving knowledge/continuing education. The need for information is therefore secondary, prompted mainly by these three primary needs.

5.3 Information needs of medical doctors

Respondents were asked about the information needs that applied to their medical practice. Table 5.1 summarises the information needs of medical doctors using a list constructed based on the literature review. In this study, respondents indicated that they needed information for all the different reasons on the list, albeit in various measures.

Which of the following information needs apply to you in relation to your work as a medical practitioner? (Tick all that apply to you)

Table 5.1: Information needs of medical doctors

		Male		Female		Total	
		Count	%	Count	%	Count	%
Improving your clinical decision-making	No	8	11.3%	4	5.6%	12	16.9%
	Yes	23	32.4%	36	50.7%	59	83.1%
Keeping up-to-date	No	8	11.3%	4	5.6%	12	16.9%
	Yes	23	32.4%	36	50.7%	59	83.1%
Improving your knowledge	No	6	8.5%	6	8.5%	12	16.9%
	Yes	25	35.2%	34	47.9%	59	83.1%
Continuing education	No	8	11.3%	5	7.0%	13	18.3%
	Yes	23	32.4%	35	49.3%	58	81.7%
Sharing knowledge with your colleagues	No	9	12.7%	9	12.7%	18	25.4%
	Yes	22	31.0%	31	43.7%	53	74.6%
Answering colleagues' questions	No	10	14.1%	14	19.7%	24	33.8%
	Yes	21	29.6%	26	36.6%	47	66.2%
Answering patient's questions	No	11	15.5%	9	12.7%	20	28.2%
	Yes	20	28.2%	31	43.7%	51	71.8%

Writing reports/research paper not for publication)	No	18	25.4%	24	33.8%	42	59.2%
	Yes	13	18.3%	16	22.5%	29	40.8%
Writing reports/research paper (for publication)	No	19	26.8%	29	40.8%	48	67.6%
	Yes	12	16.9%	11	15.5%	23	32.4%
Teaching staff / students / colleagues (case presentations)	No	9	12.7%	8	11.3%	17	23.9%
	Yes	22	31.0%	32	45.1%	54	76.1%

It is noteworthy that all the information needs were ticked by more than half of the respondents, which shows that medical doctors need information for all the stated reasons. Although medical doctors need information for all the reasons stated above, the majority indicated that they needed information for improving clinical decision-making (83.1%), keeping up-to-date (83.1%), improving their knowledge (83.1%) and continuing education (81.7%). The results of this study concur with Wilson's (1996) model of information seeking which states that information needs can be physiological, emotional or cognitive.

All the three areas of information need expressed in this study as noted by Wilson are in themselves motivating factors for an individual to experience an information need. In this case medical doctors as Katutura and Windhoek Central state hospitals are motivated to look for information by their need to make clinical decisions, to keep up-to-date, to improve their knowledge/for continuing education.

It should be noted that there were no significant correlations between the information needs and the independent variables (gender, age, work place, department, level of education, job title, experience as a medical doctor, and

experience at the current hospital). There was however a weak association between nationality and the need for information for teaching staff/students/colleagues ($r = -.238, n = 71, p < .05,$). The negative sign in this result is simply due to the arrangement of the items in SPSS. A further analysis of the statistics helped the researcher to see that there was a slightly larger difference between the 'Yes' and the 'No' responses of non-Namibians than those of the Namibian doctors. This implies that a slightly higher percentage of non-Namibians needed information for teaching than not, compared to the Namibian doctors. This finding could be explained by the fact that one of the expectations placed on non-Namibian experts is to train Namibian nationals (The Namibian newspaper, 13 July 2018, online).

It is noteworthy that a closer analysis of the need of information for improving clinical decision-making, keeping up-to-date, improving knowledge, and continuing education revealed significant correlations, as shown in Table 5.2 below.

Table 5.2: Significant correlations - Information needs

Correlations

		Improving your clinical decision-making	Keeping up-to-date	Improving your knowledge	Continuing education
Improving your clinical decision-making	Pearson Correlation	1	.398**	.398**	.398**
	Sig. (2-tailed)		.001	.001	.001
	N	71	71	71	71
	Pearson Correlation	.398**	1	.699**	.699**

Keeping up-to-date	Sig. (2-tailed)	.001		.000	.000
	N	71	71	71	71
Improving your knowledge	Pearson Correlation	.398**	.699**	1	1.000**
	Sig. (2-tailed)	.001	.000		.000
	N	71	71	71	71
Continuing education	Pearson Correlation	.398**	.699**	1.000**	1
	Sig. (2-tailed)	.001	.000	.000	
	N	71	71	71	71

**. Correlation is significant at the 0.01 level (2-tailed).

It is noteworthy that there was a perfect positive correlation between 'improving your knowledge' and 'continuing education' $(r = 1, n = 71, p < .01)$, which may have been interpreted by the respondents to mean the same thing. These are therefore combined in the discussions below. Another interesting observation is that Table 5.2 shows a much lower, though significant, association between improving clinical decision-making and the other three information needs (keeping up-to-date, improving knowledge, and continuing education) of $r = .398$. The significance however remains high at $p > .01.$ A possible explanation could be that the other three variables have to do with gaining knowledge, which then helps them to make informed clinical decisions, hence the association. Clinical decision-making is therefore impacted by keeping up-to-date, improving knowledge, and continuing education.

It was against this background that the researcher asked the interview participants to expand on the importance of improving clinical decision-making, keeping up-to-date, and improving one's knowledge/continuing education.

Based on the above findings on medical doctors' information needs, the researcher asked interview participants to shed more light on the three information needs that were found to have significant correlations in this study, i.e. 'improving clinical decision-making', 'keeping up-to-date', and improving knowledge/continuing education.' The next three subsections are therefore discussions of these three information needs in light of the interview findings and the literature review.

5.3.1 Improving clinical decision-making

As evident in Table 5.1, seeking information to improve clinical decision-making was a major factor in the survey. This was confirmed by most interviewees who said that improving their knowledge helped them with making decisions as to what treatment to administer to their patients.

Similarly, many studies and literature reviews on information needs and information-seeking behaviour of medical professionals have revealed that they need information to help inform patient diagnosis or treatment (Arraid, 2011; Kapiriri & Bondy, 2006; Callen et al., 2008; Al-Dousari, 2009; Clarke et al. 2013; Formoso, et al., 2016; Brennan et al., 2014; Lee, 2013). Bryant (2004) concurs that the clinical care of patients is the primary reason for seeking information. It should be noted that in this current study, clinical decision-making encompasses clinical care. This finding is also echoed by Dorsch's (2000) review of literature on the information needs of rural health professionals, in which patient care emerged as the primary reason for seeking information. Contrarily though, Strother, Lancaster, and Gardiner's study (1986), revealed that the majority of

dentists (89%) sought information primarily to keep up with new developments. Patient care was ranked second (85%) in Strother et al.'s study. This is possibly because dentists use tools that continually change frequently and they need to keep up-to-date with the new developments, while other medical doctors deal with a range of complex scenarios and may need information primarily to make clinical decisions. These differences confirm Wilson's (1996) model, which states that the rise of a particular information need is influenced by the context. The context includes the role that the person plays (Case, 2002, pp. 137).

A study by Nel and Fourie (2010) on veterinary practitioners has revealed that other professionals who are not necessarily medical doctors also need information primarily to make professional decisions.

The above discussion shows that the need for information to help with decision-making is not peculiar to the Namibian or African medical doctors, as literature has confirmed it to be a global need.

5.3.2 Keeping up-to-date

Most of the interviewees indicated that the nature of their profession required them to keep up-to-date with what is going on in the medical field. One mentioned that there are new researches conducted every day; hence the need for one to keep up-to-date with what is going on.

These results are similar to the findings of Nwezeh et al.'s (2011) study, which revealed that all (100%) doctors need information on new developments in their areas of specialty. A survey by Ocheibi and Buba (2003) found that keeping up

with current information to improve knowledge was the most frequently mentioned information need by participants.

The interviewees provided more details on why keeping up-to-date with current health information was one of the most important information needs for medical doctors. The interviewees mentioned that it helps them to make the best clinical decisions and that good medical practice can only be achieved through keeping up-to-date with current information. One interviewee said:

'The medical profession keeps on changing daily; hence proper management of the patients is only possible when one keeps a clear look on recent changes in the profession'.

Keeping up-to-date is a requirement in the medical profession. This is in line with the General Medical Council (2006, p. 6) in the UK, which identifies the qualities of good practising medical doctors thus: 'Good doctors make care of patients their first concern: they are competent, keep their knowledge and skills up-to-date, establish and maintain good relationship with patients and colleagues, are honest and trustworthy, and act with integrity.' Doctors need to keep up-to-date with current information for them to improve their performance. If doctors fail to keep abreast with current issues in their specialty, they cannot improve their performance (González-González et al., 2007, p. 345). According to the Namibian Medical and Dental Professions Act 1993, No. 2851, it is misconduct for a medical practitioner to participate in a discussion of health issues without possessing the necessary knowledge (Ministry of Health and Social Services, 2002).

5.3.3 Improving knowledge/continuing education

In this study, a high percentage (83.1%) of the questionnaire respondents indicated that they needed information to improve their knowledge, while 81.7% ticked 'continuing education'. Most interviewees concurred that improving their knowledge would help with making decisions as to what treatment to prescribe to their patients.

Several studies on different user groups (Arraid, 2011; Nel & Fourie, 2010; Norbet & Lwoga, 2012; AI-Dousari, 2009; Brennan et al., 2014; Andualem et al., 2013; Mabhiza, 2016; Mabhiza, Shatona, & Hamutumwa, 2012; Chikonzo & Aina, 2001; Vali & Esmail, 2014; Prakasan, 2013; Singh, 2012) have confirmed that improving knowledge is one of the main reasons why information users seek information. Arraid's (2011) study found that the main contexts that give rise to doctors' information needs are education and clinical practice. In Arraid's study, ambiguity, uncertainty, rare diseases, and the multiplicity of options were the motivations for information seeking. Norbet and Lwoga's (2012) study on the information-seeking behaviour of physicians in Tanzania also found that the physicians needed information to enhance their knowledge on a daily basis for patient care. Younger's (2010) review on Internet-based information-seeking behaviour amongst doctors and nurses showed that their reasons for searching for information online are primarily patient care and continuing professional development.

It can therefore be concluded from the discussion above that medical doctors need information primarily to enhance their clinical decision-making, to keep up-

to-date, and to improve their professional knowledge (continue education). Wilson (1999) asserts that there must be a motivating factor for an information need to arise, which in this case is the need to enhance clinical decision-making, to keep up-to-date, and to improve professional knowledge. AI-Dousari (2009) concurs that these three needs are essential in clinical decision-making. The satisfaction of all these information needs leads to good medical practice (González-González et al. 2007). Wilson (1999) asserts that information needs are caused by primary needs, which are, in this case, the need to make clinical decisions, keep up-to-date, and improving professional knowledge. These three core needs (clinical decision-making, keeping up-to-date, and improving professional knowledge - or professional development) are therefore closely related in ensuring good clinical practice, as illustrated in Figure 5.1 below.
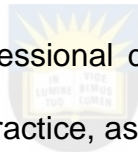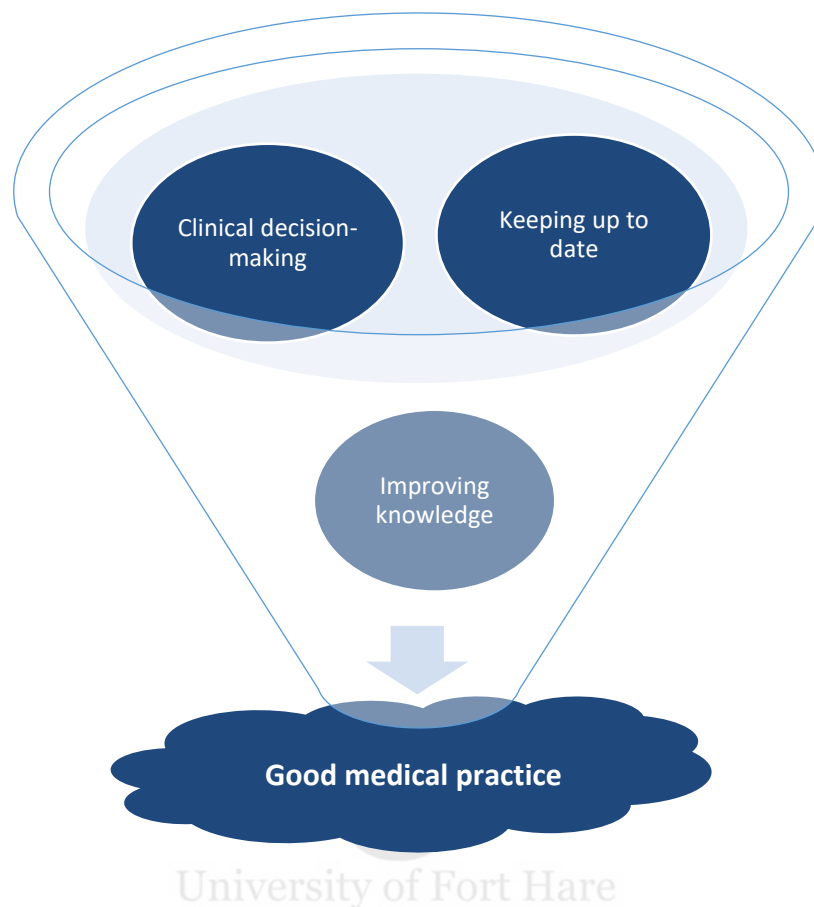
Figure 5.1: Components of good medical practice by doctors

(Source: Author, adapted from AI-Dousari's [2009, p. 279] concept)

5.4   Conclusion

The study has revealed that medical doctors need information primarily to enhance their clinical decision-making, to keep up-to-date, and to improve their professional knowledge/continue education. These findings have been echoed by other researchers. The need to make good clinical decisions, keep up-to-date with information, and to improve professional knowledge motivate doctors to seek information. This, as noted earlier, is in line with Wilson's (1996) model of information seeking, which states that there must be a motivating factor for

individuals to feel the need for information. The results of the current study as well as literature have confirmed that it is good medical practise for doctors to seek information for clinical decision-making, keeping up-to-date, and improving knowledge. The study has also confirmed what Wilson states in his fourth phase of information search, that even when individuals have knowledge of a specific area, they still need to continue searching for information to keep up-to-date with their professions. Doctors at Katutura and Windhoek Central state hospitals have indicated that even though they are knowledgeable about their profession, they still need to keep up-to-date with the new developments in the medical field. Doing so will enhance their clinical decision-making.

Clinical decision-making encompasses patient diagnosis or treatment, clinical care, patient care, and making professional decisions. Keeping up-to-date helps doctors to be aware of new developments in their areas of specialty and to make good clinical decisions. Keeping up-to-date is, in fact, a requirement in the medical profession. Doctors need to keep up-to-date with current information for them to improve their performance. It is actually regarded as misconduct in Namibia for a medical practitioner to participate in discussions on health issues without possessing the necessary knowledge.

Keeping up-to-date and improving knowledge/continuing education are very closely related. Doctors do not seek information only to keep up-to-date or take care of their patients, but also to further their studies. As they further their studies, they also increase their knowledge base. It seems from the results that satisfying these needs is likely to help doctors to satisfy the information need for

improving clinical decision-making. The role of the doctor in the hospital and his/her personality influence their need for information.

The next chapter focuses on the information-seeking behaviour of medical doctors and the information sources they use.

CHAPTER 6: INFORMATION-SEEKING BEHAVIOUR AND INFORMATION SOURCES USED BY PRACTISING MEDICAL DOCTORS AT KATUTURA AND WINDHOEK CENTRAL STATE HOSPITALS

6.1 Introduction

The information needs and information seeking behaviour of practising medical doctors are influenced by their context. The sources of information available and their characteristics have an influence on what gets used.

Wilson (2000) points out that, depending on personal and contextual factors, information needs may translate into information-seeking behaviour as individuals respond to those needs. Information-seeking behaviour includes the purposive seeking of information in relation to one's problems, tasks or goals. However, sometimes people seek information simply out of a desire to acquire more knowledge. Information-seeking behaviour includes unintentional as well as purposive behaviours that may not necessarily involve seeking but actively avoiding information. According to Wilson (1999), the risk or reward involved in information seeking may lead to active or passive information-seeking behaviour.

The sources and resources of information may, inter alia, include hospital libraries, departmental collections, office telephones, mobile phones (provided by the hospital), Internet, online databases, personal collection, annual reports, statistical reports and meetings. The availability and accessibility of these

information sources plays a very significant role as far as information-seeking behaviour of medical doctors is concerned.

Wilson (1999) asserts that the availability and accessibility of information sources may motivate or hamper information seeking. Information sources may be available, but certain challenges, such as accessibility, may hinder one from using them. Ramos, Linscheid, and Schafer (2003) concluded that physicians prefer information sources that are accessible and known to them. If an information source is available and accessible but unknown to the user, this can be a hindrance to information seeking.

Ocheibi and Buba (2003) classify information sources as formal, informal, and semi-formal. Formal information sources include journals and books, informal information sources include meetings and seminars, while semi-formal information sources include unpublished reports and thesis. The context and the purpose for which information is sought affects the choice of the information source to be used. Flynn and McGuinness (2010) concluded that informal sources of information such as colleagues are widely used because they are familiar, reliable, immediately available, and inexpensive. This conclusion concurs with Wilson's (1996) model, which states that information source characteristics may motivate or hinder information seeking.

This chapter addresses Objectives 2 and 3 of the study, which were: to find out how practising medical doctors at Katutura and Windhoek Central state hospitals seek information; and to identify the information sources used by practising medical doctors at Katutura and Windhoek Central state hospitals.

182

These two objectives are discussed together because, as mentioned earlier, information sources are embedded within the information needs and information-seeking behaviour.

6.2 Core argument of the chapter

As doctors search for information to help them in, mainly, clinical decision-making, keeping up-to-date, and improving knowledge, as detailed in Chapter 5, they use various information sources and resources. The doctors' information-seeking behaviour is influenced by the availability, accessibility, and trustworthiness of these sources and resources, which Wilson (1999) refers to as intervening variables. Most medical doctors do not use hospital libraries because there is no library at Windhoek Central Hospital and the one at Katutura Hospital is not well equipped, which is also an availability and accessibility issue.

Patient data are the most used information source in three clinical contexts (wards, outpatients, and emergency/casualty). The use of information resources (such as hospital library, medical database, Internet, etc.) and of the doctors' personal knowledge or experience varies depending on the context. For example, in the emergency department, the doctor relies mainly on his or her personal knowledge and experience because it is readily available, while doctors in the wards and the outpatients department may have more time to refer to other information sources and resources. This confirms Wilson's (1996) assertion that the context influences the rise of an information need and affects information-seeking behaviour.

Personal collections and the Internet are preferred compared to libraries. This is because they are more easily accessible and can be used at any place and whenever necessary.

Wilson (1999) suggests that the demographic variable of education plays an important role in information-seeking behaviour. However, this study found no significant relationship between doctors' educational qualifications and information sources used.

6.3 Information sources and resources used by medical doctors

What type of information resources do you use in your hospital when you need information? (Please tick all that apply to you).

6.3.1 Hospital library

Table 6.1: Frequency of use of hospital library

		Male		Female		Total	
		Count	%	Count	%	Count	%
Hospital library	No	22	31.0%	29	40.8%	51	71.8%
	Yes	9	12.7%	11	15.5%	20	28.2%

It is evident from the results in Table 6.1 that the majority (71.8%) of the medical doctors at Katutura and Windhoek Central hospitals do not use hospital libraries. In the questionnaire, most of the respondents asked, 'Where is the library?' The interviewees working at Windhoek Central Hospital confirmed that there was no library at that hospital and that the library at Katutura Hospital was too far from

them. Those interviewees who worked at Katutura Hospital said that although there was a library, they did not use it because it was 'too small', 'very old', and 'had very few unclassified and out dated materials'. A further analysis to find out if there was any association between hospital library and the hospital confirmed this, as a correlation was found ($r = .381, n = 71, p < .05$). The weakness of this correlation might be linked to the fact that some of the doctors worked in both hospitals (see Section 4.3).

This finding is not unique to medical doctors. Studies on veterinary practitioners (Mabhiza, 2016; Nel & Fourie, 2010) revealed that libraries were the least used source of information. Contrarily, though, a study by Chikonzo and Aina (2001) on the information environment of veterinary researchers at the University of Zimbabwe showed that the Veterinary Science branch library at the university was the main provider of veterinary information to researchers. It should be noted though, that Chikonzo and Aina's target group were researchers, as opposed to actual practitioners targeted in this present study. This shows that other factors affect the use of libraries, apart from place and profession. Lee's (2013) study on the information needs of clinicians concluded that the use of the library varies depending on the location of respondents and their access to a health library. This agrees with Wilson's (1996) model, which states that context and other intervening variables, such as information source characteristics (accessibility and credibility), might motivate or hinder information seeking (p. 137).

6.3.2 Departmental collection

Table 6.2: Frequency of use of departmental collection

		Male		Female		Total	
		Count	%	Count	%	Count	%
Departmental collection	No	22	31.0%	20	28.2%	42	59.2%
	Yes	9	12.7%	20	28.2%	29	40.8%

Only twenty-nine out of the 71 participants (40.8%) indicated that they used the departmental collection in the hospital. There was a weak positive relationship between departmental collection and experience on current job ($r = .278$, $n = 71$, $p < .05$). Familiarity with the information sources could have been a factor for the participants who had worked at the particular hospital for longer.

Further analysis of the overall responses regarding departmental collections and clinical context showed a pattern of strong correlations, as shown in Table 6.3 below.

Table 6.3: Analysis of relationships between departmental collection and clinical context

		Departmental collection Information behaviour	Departmental collection (Outpatients)	Departmental collection (Wards)	Departmental collection (Casualty)
Departmental collection (Information behaviour)	Pearson Correlation	1	.415**	.447**	.249
	Sig. (2-tailed)		.003	.002	.143
	N	71	50	44	36

Departmental collection (Outpatients)	Pearson Correlation	.415[**]	1	.786[**]	.835[**]
	Sig. (2-tailed)	.003		.000	.000
	N	50	50	40	32
Departmental collection (Wards)	Pearson Correlation	.447[**]	.786[**]	1	.705[**]
	Sig. (2-tailed)	.002	.000		.000
	N	44	40	44	35
Departmental collection (Casualty)	Pearson Correlation	.249	.835[**]	.705[**]	1
	Sig. (2-tailed)	.143	.000	.000	
	N	36	32	35	36

**. Correlation is significant at the 0.01 level (2-tailed).

The relationships shown in Table 6.3 shows that the participants were agreeable in their responses, regardless of the clinical context. There was therefore a general agreement that there was not much use of departmental collections. As indicated earlier, there was no library at Windhoek Central Hospital, and the one at Katutura hospital was not satisfactory to the participants. This is in agreement with Wilson's (1996) model, which states that an intervening variable, such as environment, might motivate or hinder information seeking (p. 137).

It can be concluded that practising medical doctors at Katutura and Windhoek Central hospitals do not use departmental collections much. These same sentiments were echoed by Ocheibi (2003) in a study on information needs and information gathering behaviour of medical doctors in Maiduguri, Nigeria, which found that departmental collections were rarely used.

6.3.3   Office telephone

Table 6.4: Frequency of use of office telephone

		Male		Female		Total	
		Count	%	Count	%	Count	%
Office telephone	No	14	19.7%	20	28.2%	34	47.9%
	Yes	17	23.9%	20	28.2%	37	52.1%

6.3.4   Mobile phone (provided)

Table 6.5: Frequency of use of mobile phone provided by the hospital

		Male		Female		Total	
		Count	%	Count	%	Count	%
Mobile telephone provided	No	26	36.6%	33	46.5%	59	83.1%
	Yes	5	7.0%	7	9.9%	12	16.9%

A very high percentage (83%) of respondents said that their workplaces did not provide them with mobile phones. The interviewees indicated that mobile phones were an important communication tool for doctors because of the nature of their job, as they are usually required to attend to emergencies.

The importance of mobile phones is confirmed by Gavino et al.'s (2013) study on the information-seeking trends of medical professionals and students from middle-income countries, conducted in the Philippines. The study revealed that 88% of the respondents encountered at least one clinical question daily, while

58% were very likely to search for answers, and that a basic mobile phone was the most used device at home (94%) and at work (82%). In descending order, short messaging services, email, instant messaging, and multimedia messaging services were the most commonly used messaging tools at home and at work.

Mobile phones make it possible for doctors to access information wherever and whenever they need it, which, according to Wilson (1999), motivates or hinder information seeking. The fact that the two hospitals do not provide doctors with mobile phones affects their information-seeking behaviour.

6.3.5   Internet

Table 6.6: Frequency of use of Internet

		Male		Female		Total	
		Count	%	Count	%	Count	%
Internet	No	10	14.1%	12	16.9%	22	31.0%
	Yes	21	29.6%	28	39.4%	49	69.0%

A large number of respondents (69.0%) also indicated that another resource available to them was the Internet. Some interviewees indicated that they preferred using the Internet at their homes for information instead of going to the Katutura Hospital library. The fact that majority of the participants indicated that they searched for information at home indicates a need for remote, after-hours access to medical information resources that can be accessed from home, or that alternative means of satisfying clinical questions quickly during the working hours must be found (Flynn & McGuinness, 2010). As mentioned earlier, Smith

189

et al.'s (2020) study concurs with this finding that internet access by medical doctors is important.

In AI-Dousari's (2009) exploratory study, there was a low use of knowledge-support resources such as Internet and library resources in the outpatient and emergency departments. However, use of the knowledge-support resources was highest in the wards. AI-Dousari's (2009) study further revealed that less than half of the respondents had access to the Internet, which they accessed at their working area. The reasons for using the Internet included e-mail, searching for drug and patient care information, and checking new findings. Another important study was that of Norbet and Lwoga (2012), which found that the physicians in Tanzania preferred to seek information from formal sources (e.g. printed textbooks, electronic resources, and printed journals). There was low use of the Internet for prescribing various drugs and diagnosis.

Gavino et al.'s (2013) study conducted in the Philippines revealed that more than half of the participating medical doctors and students had Internet connectivity at home (62%) and just under half had the connectivity at work (46%).

Bryant's (2004) case study on information needs and information-seeking behaviour of family doctors found that a need for problem-orientated information, related to the care of individual patients was the predominant factor that prompted these general practitioners to seek information, and electronic sources, which required Internet access, were ranked second by the participants, after personal collections.

It seems that the Internet is becoming an essential tool, not only for medical doctors, but for other professionals too. For example, a study by Nel and Fourie (2010) on the information behaviour of veterinary practitioners found that the veterinary practitioners listed the Internet as one of their preferred sources of information, even in emergencies. The majority (97.4%) of India's Dental Science professionals in Umesha and Chandrashekara's (2013) study indicated that they had access to the Internet, while 91% indicated that they used the Internet on a regular basis. The dental scientists lamented that lack of training and information overload were some of the factors affecting Internet usage. They therefore proposed that there is a need for a well planned Internet literacy programme and preparation of subject gateways to meet the needs of the dental professionals.

It is noteworthy that although the Internet has become an important tool, it is not yet accessible in some places. For example, in Naeem et al.'s (2013) survey on primary care doctors working in remote government health facilities in Pakistan, 74% of the respondents had no access to a computer with Internet, living them with no choice but to use the print format as the most preferred format for seeking clinical information.

The current study has revealed that medical doctors at Katutura and Windhoek Central state hospitals use the Internet because it is available and accessible at any time. This is in line with Wilson's (1996) assertion that information source characteristics may motivate or hinder information seeking.

6.3.6   Online databases

Table 6.7: Frequency of use of departmental collection

		Male		Female		Total	
		Count	%	Count	%	Count	%
Online	No	18	25.4%	27	38.0%	45	63.4%
database	Yes	13	18.3%	13	18.3%	26	36.6%

About 63% of the doctors indicated that they did not use online databases. However, this shows that a significant number (about 37%) used online databases.

In Arraid's (2011) study on the information needs and information-seeking behaviour of Libyan doctors, about a quarter of urban doctors and almost half of rural doctors ranked online databases as the last source to be consulted. This could be an indication of the challenges of Internet access in rural settings. The majority of doctors indicated difficulties in obtaining electronic information particularly from online databases.

Lee (2013) conducted a study on the information needs of clinicians in the Canadian and United States services and found that 40% of the respondents regularly used web-based medical information services and 46% used the Clinical Library (CL) as part of their electronic search strategy. For this study, the challenges of lack of well-functioning hospital libraries and Internet access challenges in the hospitals as detailed under Section 7.3 could have been contributing factors to the low percentage of use of online databases at the

hospitals. Online databases are, however, an important source of information for medical doctors, and the doctors' preference to access them from home rather than at the hospital is because of lack of adequate resources at the hospitals.

This behaviour is articulated by Wilson (1999), who states that, factors related to one's environmental, and information source characteristics (accessibility and credibility), might motivate or hinder information seeking.

6.3.7　Personal collection

Table 6.8: Frequency of use of personal collection

| | | Male | | Female | | Total | |
		Count	%	Count	%	Count	%
Personal collection	No	9	12.7%	6	8.5%	15	21.1%
	Yes	22	31.0%	34	47.9%	56	78.9%

As is evident in Table 6.8, personal collections were an important feature of the information sources available to most of the respondents (78.9%). The findings of the questionnaire indicated that most of the participants had a personal collection of information sources, which they used in the hospital. This is contrary to Davies' (2009) study, in which colleagues were used extensively because they were 'familiar, reliable, immediately available, and inexpensive; they give concise, organised answers that synthesise available information' (p.170).

In Bryant's (2004) case study on the information needs and information-seeking behaviour of family doctors in the UK, personal collections remained the preferred information resource. Similarly, AI-Dousari's (2009) exploratory study

193

on information needs and information-seeking behaviour of doctors in Kuwait's government hospitals revealed that a doctor's personal collection was one of the sources most frequently used by the doctors. The importance of personal collections is proven by the finding that the doctors used them significantly in all three clinical contexts, i.e. outpatients, wards, and casualty (see Tables 6.12, 6.13 and 6.14 below). The above discussion seems to suggest that personal collections are an important source of information, both locally and internationally.

Having found that personal collections were important, the researcher sought to obtain more information from the interview participants on the types of resources in their personal collections. Most of the interviewees mentioned textbooks, reference books, pocket books, personal computers, laptops, and Personal Digital Assistants (PDAs). Others mentioned that they had handouts from conferences. One interviewee from Windhoek Central Hospital said she had DVDs and YouTube downloads. A doctor from Windhoek Central Hospital mentioned online database subscriptions:

'My collection is my subscription to good databases which can be accessed anywhere anytime as long as I have credit in my phone.'

Literature has revealed various types of personal collections used by doctors. A study conducted by Dee, Teolis, and Todd (2005) on physicians' use of PDAs in clinical decision-making highlights the importance of PDAs. Al-Dousari's (2009) study revealed that Kuwaiti doctors' personal collections consisted primarily of electronic resources. Although the findings of Dee et al. (2005) and Al-Dousari

194

(2009) agree with the findings of this study in terms of electronic resources and PDAs, most doctors in this study mentioned other types of personal collections, such as books and computers, more than electronic resources, probably because of Internet access challenges. Al-Dousari's finding also contradicts the results of a study by Nwezeh et al. (2011), which revealed that the most common type of doctors' personal collections are textbooks. The interviewees also said that their personal collections gave them independence as they were a quick reference, and they could use them in any place and any time they wanted. Since they did not have safe places to keep their personal collections in the hospital, accessibility of the electronic resources gave practising medical doctors more flexibility to use the resource whenever and wherever they wanted. They also said that they updated their collections by purchasing new books, attending conferences and searching the Internet. Ocheibi and Buba (2003) found that the most common source of current awareness used by doctors were publishers' catalogues and the 'invisible college', or as Crane (1972) puts it, 'social network', whereby doctors depend on each other for the exchange of ideas. A study by Mcknight (2002) showed that doctors often emphasised that their preferred source format should be online or on a handheld device. This is in agreement with the sentiments of the interviewed doctors, who explained that cell phones and laptops were the most common Personal Information Communication devices they were using to access free databases as well as to access PowerPoint presentations from seminars and workshops. Only one participant said that she had access to online journals through her former medical school in South Africa. The majority of participants who used personal devices said that

they used their devices to google. In this study, both physical books and electronic resources were among the main types of personal collections of the participating doctors.

The interviewees were also asked where they kept their personal collections and where they used them. Most of them said they kept their personal collections in their homes and that they used them frequently at home and sometimes at work. This seems to explain the doctors' use of personal electronic resources, as they accessed the Internet mainly from their homes (see Subsection 6.4.11). Besides, some interviewees attached ethical and trust issues in using personal collections during work. For example, another question for the interviewees was whether they consulted their personal collections during consultation time. One interviewee who worked at both Katutura and Windhoek Central hospitals said,

'No you cannot do that because it erodes patients' trust in you.'

Other interviewees said that before the patient came into the consultation room they read the patient's file and if there was need to consult their collection, they did so before the patient came in.

Al-Dousari's (2009) study revealed a similar problem, where the participants lamented that they had to keep personal collections at home because there were no cabinets in the hospital, which makes electronic resources easier as they are more flexible and portable.

In contrast to the findings of this study, Al-Dousari's study found that the participants used their personal collections in front of patients, although

participants concurred with the participants in this study that such a practice 'undermines the doctor's character in the eyes of the patient, which may negatively influence the treatment' (Al-Dousari, 2009, p. 303).

The interviewees were also asked whether there was any systematic arrangement of their personal collections. The majority said that they had no systematic arrangement as far as their personal collections were concerned, which at times gave them a big challenge. One said,

'They are not that many. I take to work the one that I need most.'

The doctor from Windhoek Central continued:

'At home I have a big collection and these are not in order at all.'

This interview finding shows that the doctors' personal collections were not organised. This could be due to lack of time or lack of knowledge on how to organise their collections. In contrast, the participants in Al-Dousari's study showed that they had a way of organising their electronic personal collections. This contrast could be explained by the fact that the personal collections of Al-Dousari's participants were primarily electronic resources, while the ones in this study were mostly in book form.

The issue of updating personal collections was also pursued during the interviews. Interviewees indicated that they updated their collections by renewing their subscriptions, attending conferences and accessing the Internet. A doctor from Windhoek Central Hospital noted,

'I am fortunate. I studied in South Africa and I have made subscriptions to online databases but it is very expensive.'

Another issue of interest was the importance of using a personal collection. Most interviewees indicated that personal collections met and satisfied their information needs. They also indicated that personal collections helped them to manage their patients as well as provide lectures. The doctor who worked at both Katutura and Windhoek Central hospitals said,

'*I trust my book because the information is tested. I even know which page talks about what.*'

The interview participants in this study indicated that they preferred using their personal collections because they satisfied their information needs of wanting to keep up-to-date in their areas of specialty. Previous studies showed that the most common reasons for the use of personal collections by doctors were to improve patient care, improve clinical decision-making, and keep up-to-date (Tenopir et al., 2007). This is closely related with the information needs outlined in Chapter 5, where improving clinical decision-making, keeping up-to-date, and improving knowledge were found to be the most important information needs. Therefore, personal collections contribute significantly to these needs.

In the current study, personal collections are an important source of information for practising medical doctors. This conclusion is in line with Wilson's (1996) model, which states that issues of availability and accessibility may motivate or hinder information seeking.

6.3.8 Annual reports

Table 6.9: Frequency of use of annual reports

		Male		Female		Total	
		Count	%	Count	%	Count	%
Annual reports	No	26	36.6%	29	40.8%	55	77.5%
	Yes	5	7.0%	11	15.5%	16	22.5%

Annual reports are Ministerial reports from the Ministry of Health and Social Welfare. More than three quarters (77.5%) of the respondents indicated that they did not use annual reports. This could be attributed to issues of accessibility. Clarke, Belden, Koopman, Steege, Moore, Canfield, and Kim (2013) concluded in their study that accessibility, timeliness, and urgency are some of the factors that cause doctors to seek or not to seek information from the known sources. This, again, is in line with Wilson's model of information seeking which states that the characteristics of an information sources can be either a hindrance or a motivating factor to information seeking, which in this case was a hindrance.

No literature was found on the use of annual reports by medical doctors.

6.3.9 Statistical reports

Table 6.10: Frequency of use of statistical reports

		Male		Female		Total	
		Count	%	Count	%	Count	%
Statistical records	No	26	36.6%	29	40.8%	55	77.5%
	Yes	5	7.0%	11	15.5%	16	22.5%

Only a few respondents (22.5%) referred to statistical records. This could be attributed to availability or accessibility of the records. Again, this boils down to, as Wilson (1999) says, the characteristics of information source. Statistics are not easy to read and understand; they need to be analysed and interpreted. As a result, they may not be used by many. Besides, this may be an indication that not all doctors necessarily need statistical data. No literature was found on the use of statistical records by medical doctors.

6.3.10 Attendance of meetings

What meetings do you attend for medical practice? (Please tick all that apply to you)

Table 6.11: Meetings attended by doctors

		Male		Female		Total	
		Count	%	Count	%	Count	%
Ward rounds	No	7	9.9%	3	4.2%	10	14.1%
	Yes	24	33.8%	37	52.1%	61	85.9%

Daily meetings in your hospital	No	19	26.8%	24	33.8%	43	60.6%
	Yes	12	16.9%	16	22.5%	28	39.4%
Journal clubs	No	26	36.6%	36	50.7%	62	87.3%
	Yes	5	7.0%	4	5.6%	9	12.7%
Meetings in other hospitals	No	21	29.6%	30	42.3%	51	71.8%
	Yes	10	14.1%	10	14.1%	20	28.2%
Conferences	No	16	22.5%	21	29.6%	37	52.1%
	Yes	15	21.1%	19	26.8%	34	47.9%
Courses in other organisations	No	19	26.8%	29	40.8%	48	67.6%
	Yes	12	16.9%	11	15.5%	23	32.4%
Seminars in your hospital	No	19	26.8%	24	33.8%	43	60.6%
	Yes	12	16.9%	16	22.5%	28	39.4%
Seminars in other hospitals	No	21	29.6%	30	42.3%	51	71.8%
	Yes	10	14.1%	10	14.1%	20	28.2%
Workshops in other organisations	No	19	26.8%	29	40.8%	48	67.6%
	Yes	12	16.9%	11	15.5%	23	32.4%

The results showed that medical doctors acquired information by attending different meetings in the hospitals. Ward rounds were selected by the majority of respondents (85.9%), as they form the greater part of the doctors' actual job. A significant number of the respondents (47.9%) reported that they attended conferences to enhance their medical practice. The results showed that only 12.67% were involved in journal clubs. Interviewees mentioned that journal clubs gave them the opportunity to engage in some group discussions on current and recent topics in their areas of specialty and that this keeps them up-to-date with new health information. Interviewees explained that they were satisfied because it was during meetings that they shared up-to-date information on medical

developments. The interviewed doctors added that the benefits of attending the different meetings included improving their knowledge, keeping up-to-date with new medical information, and enhancing their clinical decision-making.

Further analysis revealed some significant correlations. A few of the correlations are worth noting. Firstly, ward rounds were related to job title. Although the relationship was weak ($r = .281, n = 68, p < .05$), it was significant. This relationship might be an indication that some doctors needed to do ward rounds, while others did not. Experience as medical doctor negatively correlated with daily meetings in one's hospital ($r = -.250, n = 69, p < .05$). This result indicates that the less experienced doctors at the hospital were the ones who attended the daily meetings more. It seems that the duties of the less experienced doctors may have required them to attend the daily meetings, while the more experienced doctors focused more on other issues. This correlation was very weak though.

Journal clubs also correlated significantly with level of education ($r = .400, n = 67, p < .01$). It seems that the higher the doctor's level of education, the more likely they were to join a journal club. This revelation concurs with Murugan and Allysornam's study (2011), which revealed a significant association between the practitioners' educational qualification and information sources such as printed journals, review articles, and association newsletters.

It was also interesting to note that less experienced doctors attended workshops and courses, both within the hospital and in other organisations more than the more experienced doctors ($r = -.236, n = 71, p < .05$),

There was a perfect correlation between meetings and seminars ($r = 1$). This perfect relationship could be because participants interpreted meetings and seminars to mean the same thing.

The acquisition of information through meetings is rated highly in the current study. Nylenna and Aasland (2000), in their study on the information-seeking behaviour of primary care physicians, also concluded that courses, meetings and congresses were considered the most important clinical medical education activities. The issues of availability, accessibility, timeliness, and trustworthiness of the information source, which Wilson (1999) refers to as characteristics of information sources, come into play.

6.4 Patterns of use of information sources and resources in different clinical contexts

The extent to which different information resources are used in three different clinical contexts was explored through the questionnaire. The results below give an indication of how medical doctors use available resources in the Outpatient department, Wards, and Casualty/Emergency department.

6.4.1 Outpatient department

Please circle the degree to which you use the following resources when you see a patient in the Wards, Outpatient and Casualty areas for clinical decision-making? (If you work in one department just answer the section that relates to you)

Table 6.12: Information resources consulted in outpatient department

Resources for Outpatients	Response							
	Not applicable		Never		Sometimes		Frequently	
	N	%	N	%	N	%	N	%
Ask patient	1	1.4	2	2.8	3	4.2	56	78.9
Ask patient's relatives	0	0.0	4	5.6	24	33.8	29	40.8
Ask colleagues	1	1.4	4	5.6	28	39.4	22	31.0
Ask nurses	0	0.0	5	7.0	29	40.8	23	32.4
Ask pharmacist	4	5.6	11	15.5	38	53.5	4	5.6
Ask ambulance staff	9	12.7	22	31.0	20	28.2	2	2.8
Patient's file	0	0.0	4	5.6	11	15.5	42	59.2
Order tests	2	2.8	3	4.2	5	7.0	46	64.8
Departmental collection	4	5.6	10	14.1	21	29.6	15	21.1
Drug literature	2	2.8	6	8.5	27	38.0	22	31.0
Hospital computer system	10	14.1	20	28.2	14	19.7	8	11.3
Internet	2	2.8	10	14.1	26	36.6	17	23.9
Personal collection	0	0.0	5	7.0	19	26.8	31	43.7
Medical library	11	15.5	25	35.2	16	22.5	2	2.8
Call other hospitals	7	9.9	19	26.8	23	32.4	4	5.6

Patients (78.9%), tests (64.8%), and patient file (59.2%) were key information resources for the respondents, as more than half of the doctors used them frequently, while a relatively significant number sometimes consulted pharmacists (53.5%), nurses (40.8%), and colleagues (39.4%) as information resources. In contrast to the current study, studies by Kapiriri and Bondy (2006) and Younger (2010) have revealed that medical doctors use colleagues as their first source of information. It is not surprising that a significant number of respondents (31.0%) never asked ambulance staff, since this statistic is focused on the outpatient department. Also, the medical library (35.2%) was not used as an information resource by most doctors, since there was no library at Windhoek Central Hospital and the one at Katutura was not satisfactory to the respondents (see Subsection 7.3.3). This may explain the high number of respondents (35.2%) who indicated that they never used the medical library.

There was no significant relationship between the independent variables and the behaviour with regard to information resource use in the outpatient department. However, a few associations were found between some of the dependent variables. Of note was the moderate signification relationship between drug literature and departmental collection (*r = 653, n = 48, p < .01*). This finding seems to show that those doctors who used drug literature were more likely to find it in the departmental collection. This might be an indication that the doctors understood departmental collection to include other places in the hospital department, beyond the hospital library. This conclusion is based on the fact that

there was no library in Windhoek Central hospital. This is important in the light of conclusions that were made earlier with regard to the correlations of responses on departmental collections elsewhere in this thesis (see Subsection 6.3.2).

6.4.2   Wards

Table 6.13: Information resources consulted in wards

	Response							
	Not applicable		Never		Sometimes		Frequently	
Resources for wards	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Ask patient	**0**	0.0	**2**	2.8	**8**	11.3	**48**	67.6
Ask patient's relatives	**0**	0.0	**4**	5.6	**24**	33.8	**24**	33.8
Ask colleagues	**0**	0.0	**2**	2.8	**25**	35.2	**21**	29.6
Ask nurses	**0**	0.0	**1**	1.4	**24**	33.8	**28**	39.4
Ask pharmacist	**0**	0.0	**15**	21.1	**28**	39.4	**6**	8.5
Ask ambulance staff	**0**	0.0	**25**	35.2	**13**	18.3	**3**	4.2
Patient's file	**0**	0.0	**0**	0.0	**7**	9.9	**44**	62.0
Order tests	**0**	0.0	**0**	0.0	**4**	5.6	**45**	63.4
Departmental collection	**0**	0.0	**10**	14.1	**20**	28.2	**14**	19.7
Drug literature	**0**	0.0	**2**	2.8	**21**	29.6	**28**	39.4

Hospital computer system	**0**	0.0	**20**	28.2	**12**	16.9	**9**	12.7
Internet	**0**	0.0	**8**	11.3	**25**	35.2	**16**	22.5
Personal collection	**0**	0.0	**3**	4.2	**16**	22.5	**30**	42.3
Medical library	**0**	0.0	**27**	38.0	**14**	19.7	**4**	5.6
Call other hospitals	**0**	0.0	**19**	26.8	**22**	31.0	**5**	7.0

NB: Total = 71

Again, here, the patient remains a key information resource for doctors, with 67.6% asking patients frequently. Ordering tests (63.4%) and consulting the patient's file (62.0%) also played a highly significant role as information resources. As in the outpatients' department, the medical library (38.0%) and ambulance staff (35.2%) remained rarely used in the wards. For the medical library, it has already been established that there was no library at Windhoek Central Hospital at the time of the study and that the one in Katutura State Hospital was not satisfactory. Regarding ambulance staff, only a few doctors consulted them in the wards, probably because there are not many ambulances involved with patients in wards.

There was no significant relationship between the independent variables and the behaviour with regard to information resource use in the wards. However, an interesting moderate significant relationship was found between asking ambulance staff and hospital computer system ($r = .615, n = 36, p < .01$). This correlation cannot be explained logically; therefore, it may be a coincidental relationship. A more meaningful, yet weaker relationship was found between

asking pharmacists and asking ambulance staff (*r = 557, n = 41, p < .01*). What

this finding implies is that the medical doctors use pharmacists and ambulance

staff as information sources with more or less the same frequency. This

relationship could have arisen from the fact that both ambulance staff and

pharmacists can be regarded as 'external experts', when compared with the

other human sources of information. Another explanation could be the fact that

the clinical context in question is the wards, where there is not much ambulance

traffic and there is not much need for the doctors to interact personally with the

pharmacists since pharmacists usually deal with written prescriptions. This,

however, cannot be confirmed.

6.4.3   Casualty/Emergency department

Table 6.14: Information resources consulted in the casualty/emergency department

	Response							
	Not applicable		Never		Sometimes		Frequently	
Resources for casualty	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Ask patient	**0**	0.0	**4**	5.6	**38**	53.5	**46**	64.8
Ask patient's relatives	**0**	0.0	**5**	7.0	**13**	18.3	**23**	32.4
Ask colleagues	**0**	0.0	**6**	8.5	**22**	31.0	**10**	14.1
Ask nurses	**0**	0.0	**4**	5.6	**20**	28.2	**16**	22.5

Ask pharmacist	**0**	0.0	**16**	22.5	**18**	25.4	**4**	5.6
Ask ambulance staff	**0**	0.0	**18**	25.4	**13**	18.3	**3**	4.2
Patient's file	**0**	0.0	**3**	4.2	**10**	14.1	**26**	36.6
Order tests	**0**	0.0	**2**	2.8	**6**	8.5	**29**	40.8
Departmental collection	**0**	0.0	**19**	26.8	**9**	12.7	**8**	11.3
Drug literature	**0**	0.0	**7**	9.9	**15**	21.1	**17**	23.9
Hospital computer system	**0**	0.0	**20**	28.2	**9**	12.7	**4**	5.6
Internet	**0**	0.0	**12**	16.9	**19**	26.8	**8**	11.3
Personal collection	**0**	0.0	**5**	7.0	**12**	16.9	**22**	31.0
Medical library	**0**	0.0	**25**	35.2	**10**	14.1	**2**	2.8
Call other hospitals	**0**	0.0	**22**	31.0	**13**	18.3	**4**	5.6

NB: Total = 71

Even in the casualty department, the majority of the participants indicated that they would frequently ask patients (64.8%), order tests (40.8%), or use the patient's file (36.6%).

There were no significant relationships between the independent variables and the information-seeking behaviour with regard to information resource use in the casualty department, apart from the negative relationship between experience on the current job and personal collection *(r = -.547, n = 39, p < .01).* The relationship between experience on the current job and personal collection is interesting as it suggests that the less the experience on the current job, the more the use of personal collections. A possible explanation could be the

209

association between experience on the current job and departmental collection (see Subsection 6.3.2), where it was explained that some of the newer doctors in the hospitals were not aware of the information sources in the hospitals.

A number of associations were found among the dependent variables though. Of note is the relationship between asking patient and asking patient's relatives, which was a highly significant relationship ($r = .714, n = 41, p < .01$). It should be kept in mind that this relationship is in the context of the casualty department. It, therefore, makes sense that both the patient and the relative who brings the patient to the hospital are equally important as sources of information in the emergency room. Another moderate significant relationship was between patient file and medical tests ($r = .689, n = 37, p <.01$). This also makes sense as test results are usually placed in the patient's file in a hospital setting. It seems that there are more tests done in the casualty department than the other two clinical contexts, and the patient's file is key in keeping track of the medical process. This relationship is therefore not surprising. This finding confirms Wilson's (1996) model of information behaviour, which asserts that information behaviour begins with the person-in-context. In the three contexts above, asking patients was ranked highly in all the contexts showing that the characteristic of the information source was taken into consideration than other factors.

6.4.4 Patterns in outpatients, wards, and emergency

Medical doctors meet their patients in different contexts (outpatient department, wards, and casualty/emergency department), and the results show the

importance of the availability of information resources to support their medical decision-making and to enhance patient care in these different contexts.

6.4.4.1   Information sources used

It is noteworthy that patients, tests, and patient files were rated as the most frequently consulted information sources in all the three health scenarios. The extracted table below brings into perspective how these three information sources are rated in the three scenarios.

Table 6.15: Extract of most frequently consulted information sources in hospital departments

	Outpatient		Wards		Emergency	
	N	*%*	*N*	*%*	*N*	*%*
Ask Patient	56	78.9%	46	64.8%	38	53.5%
Patient File	42	59.2%	44	62.0%	26	36.6%
Order Tests	46	64.8%	45	63.4%	29	40.8%

In addition to patient data and information resources, the interviewees added that another primary source of information to help them in their clinical decision-making was the doctor's own knowledge and experience. Doctors' clinical decision-making is therefore mainly influenced by patient data, information resources available, and the doctors' personal knowledge and experience. Elson, Faughnan, and Connelly (1997) concur that clinical-based decision-making is driven by information from patient data and clinical information

sources. This agrees with Thompson's (1997) study, which found that doctors often relied on the patient's medical data as their information source. Patient data was revealed as the most frequently used source of information in all the clinical scenarios by Al-Dousari (2009) in a study on the information needs and information-seeking behaviour of doctors in Kuwait. Results of the current study are also in agreement with those of a study by Ayatollahi et al. (2013), which revealed that patient information was considered the most important type of information.

The results revealed that the most frequently used patient data in the three contexts came through communication with the patient and reading the patient's medical files. In addition, communication with patients' relatives and medical tests play an important role in all three contexts. A study by Osheroff et al. (1991) revealed that when doctors need information for patient care, half of the information is obtained from the patient's file.

The participants in the interviews added that the nature of the patient determined information sources in the outpatients department. For example, when a new patient visits the hospital for the first time, the doctor will go through the patient's medical history by asking the patient and will undertake a medical examination. However, for a regular patient coming for a follow-up, the doctor may just examine the patient to check progress.

Interviewees indicated that they used patients' files less in the emergency room because sometimes they received walk-in patients who needed temporary treatment. Sometimes they saw patients without files because the files were

212

missing. Some respondents reported that they never gathered information from ambulance staff in outpatients and in the wards but only in the emergency rooms. This is because the ambulance staff provide services mainly to the emergency room.

According to the interviewees, the type of information sought in the outpatients department is different from that sought in the casualty department. Participants indicated that there are times when unconscious patients are brought in by relatives and doctors have to rely on the relative to obtain information on the patient's medical history. Sometimes a patient may need urgent surgery, in which case investigations and tests would have to be conducted for clinical decision-making. There is therefore less participation from the patient or patient's family in emergency situations compared to outpatients and wards. Accordingly, the clinical setting and the state of the patient dictates the information sources doctors use to make clinical decisions.

Some interview participants pointed out that they preferred some clinical settings to others because of the availability of information resources. Most of them reported that the ward area was the best place for communicating with the patients and obtaining the information they needed because they generally had adequate time to investigate and order tests. On the other hand, the interviewees clarified that outpatient departments and emergency rooms were always packed, leaving doctors without enough time to talk individually with the patients and get the necessary information. The interviewees highlighted that their time with patients was very little and they usually saw approximately 100 patients in

the outpatients department per day. Obtaining information is also critical in the emergency room. Doctors indicated that sometimes they had to make decisions with limited information. This finding is similar to that of Smith and Feied (1999) who describe the clinical decisions in an emergency environment as complicated and that doctors rely on inadequate information while faced with massive and challenging demands.

It is interesting that the Healthcare Information System (HIS) was never mentioned as a source of information. Thus, paper-based patients' medical records are currently the main source of patient data. Possibly, the use of HIS will be effective when the system is completely implemented in all government hospitals in the country.

Whether in the outpatient, wards, or emergency, results have shown that there is no relationship between the doctor's educational qualifications and information sources used. This confirms Murugan and Allysornam's (2011) study on information needs and information-seeking behaviour of Allopathic Medical Practitioners in India, which revealed that there is no association between the needed clinical information and practitioners' educational qualification. However, it was revealed in the current study that there is a relationship between educational qualifications and journal clubs for teaching staff or students. Again, as Wilson's (1996) model of information seeking states, the context or the role that an individual plays or the intervening variables affect information-seeking behaviour.

6.4.4.2 Information resources used

The questionnaire and interview findings revealed that knowledge-support resources (Internet and libraries) were used less compared to patients' data and doctors' knowledge in the outpatients, wards, and casualty. However, personal collections were used quite significantly in all three clinical contexts. This is supported by Bryant (2004) who also revealed low usage of libraries in his study. The study revealed that colleagues were sometimes used as information resources. This is in contrast to studies by Clarke et al. (2013) and Coumou and Meijman (2006), which found that doctors refer first to their colleagues when they need answers to their clinical questions. However, based on a UK case study on information needs and information-seeking behaviour of family doctors, Bryant (2004) argues that personal collections remain the preferred information resource.

Although the participants highlighted the importance of the Internet in their medical practice and reported that they frequently used the Internet to fulfil their information needs, the Internet was not used frequently in any of the three clinical contexts. These findings concur with those of a study conducted by Bennett et al. (2006), in which only 9% of doctors reported accessing the Internet for information during patient encounters. Most of the respondents in the current study never used library resources in any of the three contexts. It was highlighted earlier that the reason could be that there was no library at Windhoek Central Hospital and the one at Katutura Hospital was out-dated and too small.

It was also found that doctors' information-seeking behaviour was influenced by the way the hospital was set up. The availability and accessibility of information resources varied from one hospital to another. While both hospitals had Internet, Katutura Hospital had a library equipped with two computers, which gave the doctors an opportunity to sit and read or communicate with other doctors. The results of this study revealed that language and socio-cultural settings are some of the factors that influence the information-seeking behaviour of doctors. In situations where the patient's life is centred on the family, the doctors may seek information from a family member rather than from the patient.

It is evident from the results of this study that clinical decision-making is driven by information from different information sources. According to Bauchiner, Simpson, and Chessare (cited in Al-Dousari, 2009, p. 331), clinical decision-making will change according to the degree of use of each of the three information sources: doctors' experience and knowledge; patient characteristics; and external clinical evidence. This study found that clinical decision-making in the emergency department depended more on doctors' knowledge and patient data than information sources. This is because obtaining information in this area is very critical and restricted by many contextual factors. The finding is in line with Wilson's (1996) model of information seeking which states that the context in which one is serving affects his/her information-seeking behaviour.

6.4.5 Reasons for using patient file

Based on the literature review, which agreed with the subsequent findings of this study that patients' medical records were one of the main sources of information

used by medical doctors (e.g. Osheroff et al., 1991; Gorman, 1985), participants were asked what they used patients' files for.

For what reasons do you use the patient file / medical record? (Please tick all that apply to you)

Table 6.16: Reasons why medical doctors use patient file

		Male		Female		Total	
		Count	%	Count	%	Count	%
To record patient data	No	4	5.6%	3	4.2%	7	9.9%
	Yes	26	36.6%	35	49.3%	61	85.9%
To read patient history	No	1	1.4%	4	5.6%	5	7.0%
	Yes	29	40.8%	35	49.3%	64	90.1%
Writing report	No	7	9.9%	9	12.7%	16	22.5%
	Yes	23	32.4%	30	42.3%	53	74.6%
To discuss cases in meetings	No	6	8.5%	11	15.5%	17	23.9%
	Yes	24	33.8%	27	38.0%	51	71.8%
To follow up patient's progress	No	4	5.6%	6	8.5%	10	14.1%
	Yes	26	36.6%	33	46.5%	59	83.1%
Research study	No	20	28.2%	31	43.7%	51	71.8%
	Yes	10	14.1%	6	8.5%	16	22.5%

Table 6.16 shows that most of the 71 respondents used patients' files to read patients' history (88.7%), to record patients' data (85.9%), and to follow up patients' progress (83.1). Only a few participants (21.1%) indicated that they used patients' files for research.

There were no correlations between the independent variables and any of the reasons for using the patient file. This implies that patient files were used for the abovementioned reasons regardless of gender, age, job title, hospital, department, level of education, experience as a medical doctor, or experience at the current hospital.

A few associations were found among the dependent variables. Of note was the relationship between writing reports and discussing cases in meetings ($r = .480$, $n = 68$, $p < 001$). This result could be an indication that reports on patients are discussed in meetings, and the patient's file as a key instrument in writing such reports. Another link that was found in terms of reasons for using the patient file was between recording data and following up patients' progress ($r = .406$, $n = 68$, $p < .01$). Although the significant correlation is not strong, it informs the researcher that the use of the patient's file to record data is associated with the use of the same information source to check patient's progress.

The findings from this study are consistent with previous studies such as that of Osheroff et al. (1991), who found that about half of the information that a physician needs to treat a patient is found in the patient's medical record. Similarly, Gorman (1985) states that patient data are usually obtained from the patient's medical record. The findings in this current study explain the various reasons why medical doctors need patient files. Patient records are therefore the primary data that doctors need for clinical decision-making. It is therefore important that patient's records be kept accurate, up-to-date, and accessible for quick reference by medical doctors. The characteristics of the information

sources, as Wilson's (1996) model of information seeking states, has a bearing on the information-seeking behaviour of doctors.

6.4.6 Library most visited

Which library do you visit most? (Please tick one)

This question had two options: 'Medical library' and 'Other (specify)'. Those who selected 'Other' specified the following libraries: School of medicine, online libraries, personal library, departmental library, and community library. The results are as indicated in Table 6.17.

Table 6.17: Library mostly visited by medical doctors

		Male		Female		Total	
		Count	%	Count	%	Count	%
Library most visited	Medical library	8	11.3%	9	12.7%	17	23.9%
	School of medicine	2	2.8%	1	1.4%	3	4.2%
	Online libraries	3	4.2%	9	12.7%	12	16.9%
	Personal library	1	1.4%	1	1.4%	2	2.8%
	Departmental library	0	0.0%	3	4.2%	3	4.2%
	Community library	0	0.0%	1	1.4%	1	1.4%

As to which library the participants visited most, the majority either selected the 'Other' box or did not indicate which library they visited most. This is an important finding, especially bearing in mind that Windhoek Central Hospital did not have a library, and the one at Katutura Hospital was not satisfactory (according to both the questionnaire and interview findings). This was confirmed by the following question on the frequency of their visit as well as during the interviews that the

interviewees did not visit any library. The 23.9% for Medical Library should not be confused with Hospital Library as it includes the University of Namibia (UNAM)'s medical school library, in addition to the small Katutura Hospital library.

Although no significant correlations were found with regard to the library most visited, there was a link, albeit weak, between work place (or hospital) and this variable. This link could be related to the finding that only Katutura Hospital had a library, while Windhoek Central Hospital did not have a library. It can be noted that the availability and accessibility of information sources, as Wilson (1999) asserts in his model, has as an effect on the information-seeking behaviour of doctors.

A follow up question was also asked to establish how often participants visited these libraries.

6.4.7   Frequency of library visits

Question: *How often do you visit this library (Please tick one)*

Again, here, respondents were asked to specify if their response was 'Other'. The responses are therefore based on what the respondents specified.

Table 6.18: Frequency of library visits

		Male		Female		Total	
		Count	%	Count	%	Count	%
Frequency of visits	Daily	6	8.5%	6	8.5%	12	16.9%
	Once a week	1	1.4%	2	2.8%	3	4.2%

Once a month	6	8.5%	8	11.3%	14	19.7%
Twice a week	0	0.0%	1	1.4%	1	1.4%
Once in a while	1	1.4%	3	4.2%	4	5.6%
Never	4	5.6%	8	11.3%	12	16.9%
As needed	1	1.4%	2	2.8%	3	4.2%

The majority of respondents (31.0%) as shown in Table 6.18 did not indicate their frequency. Overall, most respondents who indicated their frequency visited a library less than once a week. Only 22.5% (16 out of the 71 respondents) visited a library at least once a week. A study by Marshall (1992) revealed that hospital libraries were visited weekly, yet in this study the weekly visits to libraries was done by a mere 4.2%.

The questionnaire results were consistent with those of the interviews, where most participants indicated that they did not visit libraries. Interviewees from Windhoek Central Hospital said that there was no library. One even asked the researcher, '*Where is the library?*' Interview participants from Windhoek Central Hospital expressed that the library at Katutura Hospital was too far from them. Another interviewee from Windhoek Central Hospital revealed that he visited the UNAM library to borrow books.

Interviewees who worked at Katutura Hospital gave a number of reasons why they did not use the hospital library. Three main reasons came up in the interviews: '*It is small*'; *it is not resourced*'; and '*it is not conducive for study*'. The interview participants familiar with the Katutura Hospital library pointed out that the collection was small and very old; hence, they would rather use the Internet

221

at home since the library had only two computers. Another interviewee said that he did not visit a library because, '*In my case it is not necessary*'.

The questionnaire and interview results showed that very few doctors visited libraries. This revelation is similar to results of the study by Ocheibi and Buba (2005) who found that more than half of their respondents did not use libraries. This study's results showed that few practising medical doctors visited libraries. Respondents indicated that the Katutura Hospital library has a very small reading area with only two computers assigned for users, the collection is too small and out-dated and some information sources are not classified. A visit to Katutura Hospital library by the researcher confirmed the concerns of the respondents (see piles of unclassified files and empty shelves in Figures 6.1 and 6.2 below).

Figure 6.1: Unclassified out-dated books in the Katutura Hospital library

(Photo taken by researcher)

Figure 6.2: Empty shelves and sitting space in Katutura hospital library

(Photo taken by the researcher)

While the Internet was accessible at the two hospitals, there was no subscription to medical databases. Table 6.18 has also shown that the majority of doctors were not interested in visiting the library. Instead, they preferred using their personal collections (78.9%) (See Table 6.8) or the Internet at their homes (90.1%) (See Table 6.21). The availability of the Internet in homes has resulted in the increased usage of ICT resources more easily without having to visit libraries. However, this is not without its challenges as not everyone has access to authoritative online information sources. Access to reliable and recent information sources is not easy.

These reasons for not using the hospital library stated above were similar to those reported in the study by Ocheibi and Buba (2003) which found that the out-dated resources in the library were the major barrier to its use by doctors.

Other barriers preventing visits to other medical libraries expressed during the interviews included distance and time constraints. These results are supported by Bryant (2004) whose study found that distance was a key factor that inhibited doctors from visiting libraries.

Some interviewees indicated that they visited libraries to get books for use in their teaching. This concurs with a study conducted by Ur and Ramzy (2004), which revealed that the use of the health information centres by doctors was linked to teaching and research responsibilities. It can be concluded that the context in which the doctor is working and the availability and accessibility of information sources plays in important role in his or her information-seeking behaviour.

6.4.8   Types of information sought in a library

What type of information resources do you seek in a library? (Please tick all that apply)

Table 6.19: Types of information resources sought by doctors in a library

		Male		Female		Total	
		Count	%	Count	%	Count	%
Books	No	6	8.5%	12	16.9%	18	25.4%
	Yes	22	31.0%	23	32.4%	45	63.4%
Serials	No	23	32.4%	34	47.9%	57	80.3%
	Yes	5	7.0%	2	2.8%	7	9.9%
Internet	No	15	21.1%	16	22.5%	31	43.7%
	Yes	13	18.3%	19	26.8%	32	45.1%

	11	0	0.0%	1	1.4%	1	1.4%
Medical database	No	17	23.9%	18	25.4%	35	49.3%
	Yes	11	15.5%	18	25.4%	29	40.8%
Thesis / research paper	No	23	32.4%	26	36.6%	49	69.0%
	Yes	5	7.0%	10	14.1%	15	21.1%
Government publications	No	20	28.2%	29	40.8%	49	69.0%
	Yes	8	11.3%	7	9.9%	15	21.1%
Statistics / annual reports	No	22	31.0%	29	40.8%	51	71.8%
	Yes	6	8.5%	7	9.9%	13	18.3%
Video tapes / microfilms	No	22	31.0%	26	36.6%	48	67.6%
	Yes	6	8.5%	10	14.1%	16	22.5%
Conference papers	No	24	33.8%	26	36.6%	50	70.4%
	Yes	4	5.6%	9	12.7%	13	18.3%

In terms of the information resources sought by medical doctors, the highest number of respondents (63.4%), as shown in Table 6.19, indicates that they looked for books. The second highest number of participants (46.5%) indicated that they would need the Internet in a library. A relatively high number (40.8%) also sought medical databases in a library. Very few participants (9.9%) indicated that they needed serials.

The questionnaire results are consistent with the interview results, in which the participants indicated that they frequently sought books in the library. Some of the interviewees said they frequently sought resources on the Internet and databases such as MEDLINE. These findings are similar to those of Tunde (2016) and Ocheibi and Buba (2003), which found that books were the most frequently sought source of information by doctors in hospital libraries.

The significant link between videotapes and the Internet, though weak ($r = .343$, $N = 64$, $p < .01$), is interesting. It may indicate that the doctors might have thought that this refers to Internet videos and not the conventional videotapes. This may need to be researched further.

Another interesting finding was the significant link between the medical database and a number of other variables when it comes to types information sought in a library (books: $r = .302$, $n = 63$, $p < .05$, thesis/research paper: $r = .386$, $n = 64$, $p < .01$, annual reports: $r = .321$, $n = 64$, $p <. 05$, and conference papers: $r = .333$, $n = 63$, $p < .01$). Although these links were weak, they were significant. This is an indication that the medical database was an important resource from which the doctors looked for all these related variables.

Different information sources and resources are available (books, Internet, and databases) but some are preferred above other possibly because of what Wilson (1999) calls information source characteristics.

6.4.9   Information resource tools used in a library

What type of information resource tools do you seek in a library? (Please tick all that apply)

Table 6.20: Information tools used in a library

		Male		Female		Total	
		Count	%	Count	%	Count	%
Library catalogue	No	20	28.2%	20	28.2%	40	56.3%
	Yes	7	9.9%	13	18.3%	20	28.2%

226

Indexing journal	No	20	28.2%	29	40.8%	49	69.0%
	Yes	5	7.0%	4	5.6%	9	12.7%
Abstracting journal	No	22	31.0%	23	32.4%	45	63.4%
	Yes	4	5.6%	10	14.1%	14	19.7%
Bibliographies produced by library staff	No	22	31.0%	31	43.7%	53	74.6%
	Yes	4	5.6%	2	2.8%	6	8.5%
Ask librarians	No	15	21.1%	19	26.8%	34	47.9%
	Yes	12	16.9%	14	19.7%	26	36.6%

The questionnaire responses showed that when the participating doctors needed to obtain information in the library, they would mostly ask librarians (36.6%) or query the catalogue (28.2%). The interview participants confirmed this. One interviewee from noted:

'*We desperately need help from librarians to search for information but it should be someone who has knowledge of medical terms.*'

Another interviewee said, *'I just Google'*.

Results of a study by Ocheibi and Buba (2003) echoed similar sentiments that medical doctors seek assistance in literature searches from librarians. Calling for assistance from the librarians is crucial in accessing doctors' information needs (Lappa, 2005). However, the role of librarians in this current study was less effective in helping doctors to search the Internet and use online resources. The interviewees in this study indicated that the existing library at Katutura Hospital did not have the information they needed, thus, the librarian was of no use. Another issue that arose from the interviewees was that the Assistant

Librarian was not qualified to deal with medical issues. A study by Al-Ansari and Al-Enezi (2001) revealed that the majority of the medical library staff were not professional librarians; hence, they could provide only basic information services.

The results of Khudair and Cooke's (2008) study showed that clinicians were less likely to call for assistance from library staff to access electronic services in the library and most of them preferred to use the electronic services by themselves, probably for the above reasons.

No strong correlations were found between the independent variables and the doctors seeking the above information resource tools in a library.

The reason that doctors would prefer asking librarians compared to other information sources in a library can be attributed to the timeliness with which librarians are likely to provide answers compared to other information sources. This is in line with Wilson's model of information-seeking behaviour, which states that information seeking is influenced by the information source characteristics.

6.4.10 Use of the Internet

Do you use the Internet for health information? (Please tick one box)

Table 6.21: Doctors' use of the Internet for health information

		Male		Female		Total	
		Count	%	Count	%	Count	%
Use of Internet for	No	2	2.8%	1	1.4%	3	4.2%
health information	Yes	27	38.0%	37	52.1%	64	90.1%

It is noteworthy that although the results showed a lack of ICT resources in the two hospitals (see the pictures in Figures 6.1 and 6.2), the doctors who were interviewed indicated a heavy reliance on ICT resources for clinical information. Questionnaire results showed that nearly all respondents (90.1%) used the Internet (as shown in Table 6.21). The interview participants clarified that they accessed the Internet at home and not at the hospitals. The Internet is a very powerful information resource used by almost all doctors as indicated in Ajuwon's (2006) study. In their article, 'Assessment of Internet use and effects among healthcare professionals: a cross-sectional survey', Podichetty, Booher, Whitfield and Biscup (2006) confirm that the Internet and web-based health electronic information sources are commonly used among health professionals. Interviewees in this current study indicated that they accessed the Internet on a daily basis. However, this is in contrast to a study by Casebeer et al. (2002), which found that high percentage of doctors accessed the Internet monthly, while only 8% reported daily access.

When probed about the websites they visited, the interviewees mentioned Medline, PubMed, E-medicine, and Medscape. One interviewee also mentioned the Google search engine. With regard to the criteria that they used to determine which website to use, one spoke about accessibility, being up-to-date, and clarity. In terms of their experiences with the computerised healthcare information system, all the interview participants said that there was no computerised healthcare information system in Namibia. One interviewee said,

'It was started but it died a natural death. Someone should start it. Our patients continue to lose their medical passports and if this information was in our database we could easily discover and help our patients'.

Another interviewee said,

'Unless they have money to employ someone, we do not need a computerized information system. We don't have time to query the computer while patients are waiting'.

With regard to the use of cell phones, the questionnaire results showed that none of the respondents had mobile phones provided by their hospitals; hence, they used their personal phones to communicate with their colleagues. Interviewees were asked about the value of having cell phones provided by the hospital and they said that they used landline phones but it would be *'great'* if they could be provided with cell phones to do their work.

The Ministry of Health and Social Services in Namibia has introduced a computerised patient medical records system; namely, the Health Information

System (HIS). Even though this is the Government's desire, nothing seems to be moving along that direction, as the system has not yet been implemented. Although Wang et al. (2003) have argued that electronic health records are the most efficient for the monitoring of patient data, one doctor who was interviewed in this study said,

'It is cheaper and easier to run a manual health system than an electronic health system because the electronic system would need someone who knows how to operate it.'

The questionnaire results demonstrated that the Health Information System (HIS) in the two hospitals was not functional. The interviewees stated that they had problems implementing HIS. They explained that electronic health information systems were time-consuming, as they required someone to input patient data in both paper and electronic records. Some interviewees indicated that they needed training on how to use the system. One respondent said,

'Even with an electronic record, I still need a hard copy so someone has to print it for me.'

According to a study by Reed (2007), the barrier to successful implementation of electronic health records is the fact that doctors are resistant to change. However, the results show that the doctors in this study needed training on how to use the system. The questionnaire and interview results of the current study showed that some doctors were dissatisfied with the current medical record keeping in the two hospitals. Participants mentioned missing medical passports

of patients or inaccessibility thereof as problematic, which resulted in them seeing patients without the necessary documents.

Although some doctors prefer manual documentation, a study by Stausberg (2008) revealed that paper-based records have the following problems: inaccessibility, incomplete information, data redundancy, and consuming space for archiving. Hameed (2008) found other problems of using paper-based patient records such as the lack of backup and the large number of forms, which when allied to the shortages of staff, leading to difficulties in recording all the patient's data and the possibility of some information going missing.

Although a very high percentage of the doctors (90%) used the Internet for health information, there were no strong correlations among the variables. This is an indication that the doctors' use of the Internet was not dependent on gender, age, hospital, department, job title, level of education, or experience. It can also be noted that although Internet is available at the two hospitals, it is not accessible because doctors are not provided with mobile phones. This is in line with Wilson's (1996) model of information seeking which states that factors related to one's social role, environmental characteristics, and information source characteristics can either motivate or hinder information seeking.

6.4.11 Place where the Internet is used

Where do you use the Internet? (Please tick all that apply)

Table 6.22: Place where doctors use the Internet most

		Male		Female		Total	
		Count	%	Count	%	Count	%
Hospital	No	12	16.9%	16	22.5%	28	39.4%
	Yes	17	23.9%	23	32.4%	40	56.3%
Home	No	1	1.4%	0	0.0%	1	1.4%
	Yes	28	39.4%	38	53.5%	66	93.0%
Hospital library	No	28	39.4%	37	52.1%	65	91.5%
	Yes	1	1.4%	1	1.4%	2	2.8%
Internet cafe	No	28	39.4%	35	49.3%	63	88.7%
	Yes	1	1.4%	3	4.2%	4	5.6%
Other libraries	No	26	36.6%	36	50.7%	62	87.3%
	Yes	3	4.2%	2	2.8%	5	7.0%

The majority of respondents (93.0%) used the Internet at home. However, the high percentage (56.3%) of doctors using the Internet at the hospital seems to be contradictory to the finding that the Internet and ICT service at the hospital was unsatisfactory. There is a probability that the doctors were searching the Internet using their personal cell phones using their own mobile data. The finding that only two (2.8%) participants indicated that they used the Internet in the hospital library is however tallying with the finding that the library is too small and poorly equipped.

The questionnaire results concur with those of Bennett et al. (2006) who found that doctors often access the Internet at home after work hours. The Interviewees revealed that time was the critical barrier affecting access to the Internet in the hospitals. This explains why medical doctors do not use the Internet during office hours. Green and Ruff (2005) in their study found that time constraints to search online resources was another barrier. The other issue that was raised was the fact that the Internet was not accessible in all areas of the hospitals. Participants in the interviews revealed that the inaccessibility of the Internet hindered them in seeking the information they needed in the hospitals. Another problem indicated by the participants in this study was the prohibitively high cost of subscribing to electronic journals and databases. Most of the interviewees indicated that they did not have access to online databases since they are expensive.
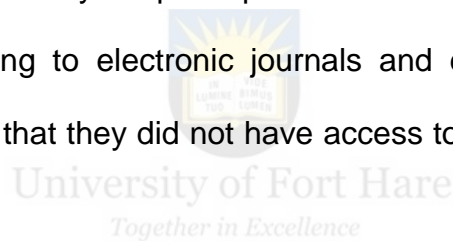
There seems to be a moderate link between the doctors' use of the Internet at the hospital library and at an Internet café *(r = .696, n = 67, p = < .01)*. However, this link is an indication of little use of these two information resources by most of the medical doctors, considering the fact that less than 6% of the doctors used these two resources (see Table 6.21).

There was a very weak and insignificant negative correlation between the use of an Internet café and age (*r = -.220, n = 66, p > .05*) and between the use of an Internet café and experience as a medical doctor (*r = -.214, n = 66, p > .05*). This suggests that when doctors use the Internet café, the younger and less experienced doctors seem to use this information slightly more than the older

and more experienced ones. The insignificant result could have been because only a few doctors indicated use of an Internet café as an information resource. Furthermore, it should be kept in mind that the majority of doctors used the Internet at their homes. The availability of mobile data in Namibia seems to be giving people the option of accessing the Internet at home, thereby reducing the need to go to Internet cafés. These results are in conformity with Wilson's (1996) model of information-seeking behaviour, which states that factors related to one's social role, environment, and information source characteristics can either motivate or hinder information seeking.

6.4.12 Use of the library

How often do you refer to the following information sources? (Please circle the frequency with which you use the library and Internet for the following reasons).

Table 6.23: Frequency and purpose of library use

	Frequency of library use							
	Not applicable		Never		Sometimes		Frequently	
Reasons	N	%	N	%	N	%	N	%
Personal use	8	11.3	17	23.9	12	16.9	10	14.1
Improving clinical decision-making	7	9.9	11	15.5	15	21.1	14	19.7
Improving knowledge	7	9.9	12	16.9	11	15.5	14	19.7

Keeping up-to-date	**7**	9.9	**15**	21.1	**5**	7.0	**18**	25.4
Continuing education	**8**	11.3	**10**	14.1	**15**	21.1	**15**	21.1
Answering colleagues' questions	**9**	12.7	**13**	18.3	**16**	22.5	**8**	11.3
Answering patients' questions	**10**	14.1	**14**	19.7	**11**	15.5	**11**	15.5
Research / reports / articles	**9**	12.7	**15**	21.1	**14**	19.7	**9**	12.7
Teaching staff/students	**8**	11.3	**12**	16.9	**12**	16.9	**9**	12.7

Participants acknowledged that there are various reasons for using the library. A high number of participants indicated that they frequently used the library for keeping up-to-date (25.4%), continuing education (21.1%), and improving knowledge (19.7%). However, an equally high number of participants indicated that they 'never' used the library for personal use (23.9%), research/ reports/ articles (21.1%), keeping up-to-date, or answering patients' questions (19.7%). In addition, quite a significant number indicated that using the library for any reason was not applicable to them. It should be kept in mind that there was no library at Windhoek Central Hospital and the one at Katutura Hospital was poorly equipped. However, some doctors used the medical library at UNAM.

The interview results showed that the most frequently mentioned need or reason why the participants sought information from the library was to keep up-to-date with new developments in their areas of expertise. These findings confirm Bryant's (2004) findings that keeping up-to-date was perceived as an information need of family doctors.

Age and experience were positively and significantly correlated with the frequency of use of the library for almost all of the reasons stated in Table 6.23, although the correlations were not strong. This indicates that age and experience have a significant bearing on the behaviour of doctors when using the library for various purposes. A very weak positive correlation was however found between experience at the current hospital and use of the library to improve knowledge ($r = .264, n = 57, p < .05$). Please note that '$n$' represents the number of respondents who selected the variable (out of the 71). Although this correlation was insignificant, it is important to note that the relatively new doctors were not aware of the existence of the library. Thus, it is mainly those who had been in the hospital for a long time who used the library to improve their knowledge, because they knew the location and contents of the library.

There was a very close interlink among all the reasons with regard to the frequency with which the doctors used the library for those reasons (as shown in Table 6.24 below).

Table 6.24: Associations among reasons for using the library

Correlations

		Personal use	Improve decision-making	Knowledge improving	Keep up-to-date	Continuing education	Answer colleagues' questions	Answer patients' questions	Research/ reports/ articles	Teaching
Personal use	Pearson Correlation	1	.891**	.803**	.736**	.691**	.778**	.707**	.684**	.646**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	47	45	41	42	44	43	43	43	38
Improve your decision-making	Pearson Correlation	.891**	1	.908**	.862**	.829**	.864**	.776**	.789**	.705**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	45	47	43	44	45	45	45	45	40
Knowledge improving	Pearson Correlation	.803**	.908**	1	.861**	.821**	.832**	.786**	.814**	.735**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000
	N	41	43	44	43	44	44	44	44	40
Keep up-to-date	Pearson Correlation	.736**	.862**	.861**	1	.911**	.806**	.707**	.769**	.755**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	N	42	44	43	45	45	45	45	45	40
Continuing education	Pearson Correlation	.691**	.829**	.821**	.911**	1	.797**	.754**	.780**	.724**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000
	N	44	45	44	45	48	46	46	46	41

Answer colleagues' questions	Pearson Correlation	.778**	.864**	.832**	.806**	.797**	1	.902**	.807**	.836**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000
	N	43	45	44	45	46	46	46	46	41
Answer patients' questions	Pearson Correlation	.707**	.776**	.786**	.707**	.754**	.902**	1	.645**	.726**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
	N	43	45	44	45	46	46	46	46	41
Research / reports / articles	Pearson Correlation	.684**	.789**	.814**	.769**	.780**	.807**	.645**	1	.824**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000
	N	43	45	44	45	46	46	46	47	41
Teaching	Pearson Correlation	.646**	.705**	.735**	.755**	.724**	.836**	.726**	.824**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	N	38	40	40	40	41	41	41	41	41

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

It can therefore be concluded that all these reasons are almost equally important for doctors when they use the library as an information resource. In fact, the very high correlations between improving clinical decision-making, knowledge improvement, keeping up-to-date, and continuing education *(r > .800, p < .01)* confirms the finding with regard to the information needs of medical doctors (See

Table 5.1). These information needs determine the behaviour of medical doctors in seeking information from the library.

6.4.13 Purpose of using the Internet

Table 6.25: Frequency and purpose of Internet use

	Frequency of use							
	Not applicable		Never		Sometimes		Frequently	
Reasons	N	%	N	%	N	%	N	%
Personal use	1	1.4	0	0.0	10	14.1	53	74.6
Improving clinical decision-making	0	0.0	0	0.0	11	15.5	49	69.0
Improving knowledge	0	0.0	0	0.0	5	7.0	52	73.2
Keeping up-to-date	0	0.0	0	0.0	6	8.5	53	74.6
Continuing education	0	0.0	0	0.0	9	12.7	50	70.4
Answering colleagues' questions	0	0.0	3	4.2	28	39.4	26	36.6
Answering patients' questions	0	0.0	9	12.7	20	28.2	27	38.0
Research / reports / articles	1	1.4	5	7.0	17	23.9	36	50.7
Teaching staff/students	1	1.4	5	7.0	19	26.8	29	40.8

As shown in Table 6.25, a large number of participants indicated that they frequently used the Internet for keeping up-to-date (74.6%), for personal use (74.6%), for improving knowledge (73.2%), for improving clinical decision-making (69.0%), and for continuing education (70.4%). Nylenna and Aasland (2000) concur that the Internet is of great or importance in keeping professionally updated. However, their study was a comparison between primary care physicians and hospital doctors, and more hospital doctors found the Internet to be of great importance in keeping professionally updated than the primary care physicians were. The interviewees confirmed the questionnaire results that they used the Internet and online resources mainly to keep up-to-date with current issues in their areas of specialisation and for personal use. Casebeer et al. (2002) also concur that medical doctors used the Internet for personal use. Bennet et al.'s (2006) study on information-seeking behaviour revealed that the primary motivation for medical information searching on the Internet was the patient's specific problem (33.7%), followed by latest research in specific topic (27.0%), new information in a disease area, and new therapy or product information (8.8%). The last three items in Bennet et al.'s study would fit within keeping up-to-date in this current study (Table 6.21).

In comparison therefore, the findings in Bennet et al.'s study and the findings in this current study with regard to reasons for searching the Internet are more or less similar. The main difference in these findings is that medical doctors in this current study mainly search the Internet for personal use. This could be

241

explained by the finding that the medical doctors in this study mainly use the Internet at their homes as opposed to their workplace (see Subsection 6.4.11).

There was no significant correlation between the use of the Internet and any of the independent variables (gender, workplace, department, level of education, job title, experience as a medical doctor, and experience at the current hospital). There was however a very weak relationship between nationality and teaching staff/students *(r = -.288, n = 54, p < .05*). The negative sign in this result is due to the arrangement of the items in SPSS, which helped the researcher to know that non-Namibian doctors used the Internet as an information source slightly more frequently for teaching purposes than Namibian doctors. This relationship confirms the finding that more non-Namibian doctors need information for teaching purposes in the hospitals (see Subsection 5.3). As indicated earlier, this could be because non-Namibian experts are expected to train Namibians (The Namibian newspaper, 13 July 2018, online).

The doctors also confirmed the relationships in improving clinical decision-making, improving knowledge, keeping up-to-date, and continuing education with regard to seeking information on the Internet (Table 6.24). There is, therefore, a pattern of this relationship throughout this study.

Results on answering patients' questions and answering colleagues also had a strong relationship with regard to doctors' information-seeking behaviour on the Internet (*r = .724, n = 56, p < .01*). This indicates that the doctors consulted the Internet to respond to questions from patients and fellow doctors in almost an equal measure.

Table 6.26: Correlations between improving clinical decision-making, improving knowledge, keeping up-to-date, and continuing education

Correlations

		Improve clinical decision-making	Knowledge improving	Keep up-to-date	Continuing education	Answer colleagues' questions	Answer patients' questions
Improve clinical decision-making	Pearson Correlation	1	.634**	.558**	.643**	0.254	0.262
	Sig. (2-tailed)		0.000	0.000	0.000	0.059	0.053
	N	60	57	58	58	56	55
Knowledge improving	Pearson Correlation	.634**	1	.500**	.716**	0.209	0.213
	Sig. (2-tailed)	0.000		0.000	0.000	0.122	0.119
	N	57	57	57	57	56	55
Keep up-to-date	Pearson Correlation	.558**	.500**	1	.481**	0.133	.306*
	Sig. (2-tailed)	0.000	0.000		0.000	0.327	0.023
	N	58	57	59	59	56	55
Continuing education	Pearson Correlation	.643**	.716**	.481**	1	0.127	0.173
	Sig. (2-tailed)	0.000	0.000	0.000		0.351	0.205
	N	58	57	59	59	56	55
Answer colleagues' questions	Pearson Correlation	0.254	0.209	0.133	0.127	1	.724**
	Sig. (2-tailed)	0.059	0.122	0.327	0.351		0.000
	N	56	56	56	56	57	56
Answer patients' questions	Pearson Correlation	0.262	0.213	.306*	0.173	.724**	1
	Sig. (2-tailed)	0.053	0.119	0.023	0.205	0.000	
	N	55	55	55	55	56	56

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The results related to use of the library and use of the Internet are almost similar.

Therefore, whether it is in a library or online, medical doctors seek information

mainly to keep up-to-date, improve knowledge, improve clinical decision-making, and continue education, confirming the four main areas of information needs (see Section 5.3). The purpose of Internet and library use therefore correlates with the general information needs of medical doctors.

The availability of libraries or Internet does not change or affect the information need but the information-seeking behaviour. This confirms Wilson's (1996) assertion that information need emanates from one's context or role that one plays.

6.5 Conclusion

The study has revealed that medical doctors use different information sources to do their work. Results of this study are that doctors use office telephones, Internet, personal collection, and meetings as sources of information. The basis for using these information sources is their availability, accessibility, timeliness, and trustworthiness. Only few of them use hospital libraries, departmental collections, mobile phones, online databases, annual reports, and statistics because they are not available to everyone and, where they are available, they are not up-to-date or are not accessible. This is in line with Wilson's (1996) model of information seeking, which points out that the characteristic of an information source can be a motivating factor or hindrance to information seeking.

The study has also revealed that the information-seeking behaviour and information sources used by medical doctors vary based on the clinical context

in which the doctor is operating; namely, wards, outpatients, and emergency (or casualty). In the wards, doctors seem to be a bit more relaxed as they are able to refer to information resources more, compared to the outpatient department. However, patient data remains the most used information source compared to information resources (such as hospital library, medical database, Internet, etc.) and doctors' personal knowledge and experience.

Majority of the respondents who visited the library indicated that they do so mainly to access books. This could be because books are expensive; thus, visiting a library to use books will be understandable. Another possible reason for visiting libraries to use books is that books are not affected when there is no electricity, unlike the Internet.

Even though Internet is available at the hospitals, it is not accessible easily as doctors are not provided with mobile phones to use at the hospitals. The availability of libraries and the Internet does not change the information needs as the needs are necessitated by the context or that role the doctor plays.

The study revealed that majority of the medical doctors at Katutura and Windhoek Central hospitals did not visit libraries as Windhoek Central Hospital did not have a library and the one at Katutura Hospital was not satisfactory.

The medical doctors who visited the library would do so to look for books. The study also revealed that when the participating medical doctors needed to obtain information in the library, they would mostly ask librarians or query the catalogue. Although the results showed a lack of ICT resources in the two hospitals, the

doctors who were interviewed indicated a heavy reliance on ICT resources for clinical information. Most of them indicated they used the Internet at home and not at the hospital.

The study revealed that those medical doctors who frequently visited the library or use the Internet did so to keep up-to-date, continue education, and improve. The purpose concurs with Wilson's fourth phase of information search, which states that even when some is knowledgeable about a specific subject, they still need to continuously search for information to keep up-to-date. However, a high number of participants indicated that they 'never' used the library for personal use as there was no library at Windhoek Central Hospital and the one at Katutura Hospital was poorly equipped.

Having discussed the information-seeking behaviour of medical doctors and the information sources they use, the next chapter focuses on factors that affect the medical doctors in acquiring information.

CHAPTER 7: FACTORS AFFECTING PRACTISING MEDICAL DOCTORS AT THE TWO HOSPITALS IN ACCESSING AND ACQUIRING INFORMATION

7.1 Introduction

Information needs may arise in contexts that may affect doctors' information-seeking behaviour. Wilson's (1996) model of information seeking notes that intervening variables, such as environment, and information source characteristics have an effect on the information-seeking behaviour of the information seeker.

In this study, factors are situations or conditions that affect the information-seeking behaviour of medical doctors. The literature review has shown that there are a number of factors that affect medical doctors in accessing and acquiring information, both on the African continent and internationally (e.g. Clarke et al. 2013; Tunde 2016; Norbet & Lwoga 2012; Aguolu & Aguolu 2002; Horrocks (1994). These factors include, among others, inadequate resources, lack of qualified staff, lack of information searching skills, limited funding, high cost of journal subscriptions, limited library space, and limited opening hours of the library.

The factors may also apply to the context in which the medical doctor is operating. The social, economic, spiritual, and physical context in which the medical doctor is operating may have a bearing on his/her information-seeking behaviour. Some societies may not allow certain members of society to give information. For example, a child or woman may not be allowed to give out

information without authorisation by a male or older member of the family. This, in a way, affects the doctor's information-seeking behaviour. Language is another factor that affects the behaviour of doctors as they seek information. For example, if the doctor does not understand the language of the patient or the language of the information sources he/she intends to use, this may affect his/her information-seeking behaviour.

The economic situation of a country or an organisation can also affect the information-seeking behaviour of medical doctors. Doctors may need mobile phones to communicate with each other; they may also need to subscribe to electronic databases, but if the organisation is not financially sound to provide them, this may affect doctors' information-seeking behaviour.

The same can be said about the spiritual and physical contexts. Some people, because of their spiritual beliefs, may or may not visit hospitals, which also has a bearing on the information-seeking behaviour of medical doctors. The physical context in which doctors are operating has a bearing on their information-seeking behaviour. For example, the availability of a physical library and the provision of places for users to seat and do their work has an effect on the information-seeking behaviour of doctors.

This chapter addresses Objective 4 of the study, which was to identify factors affecting practising medical doctors at Katutura and Windhoek Central state hospitals in accessing and acquiring information for their medical practice.

7.2   Core argument of the chapter

There are a number of factors that may affect the information-seeking behaviour of medical doctors. In this study, the main factors affecting information-seeking behaviour were language problems (54.9%), lack of patients' understanding of medical terms (52.1%), unavailable or inadequate library resources, missing or inaccessible medical records, and lack of time.

While the current study revealed that language is the main barrier to information seeking by medical doctors, some studies argue that time constraints are the number one barrier for medical doctors (Flynn & McGuinness, 2010; Green & Ruff, 2005). In Flynn and McGuinness' study of clinicians in Ireland, 89% of the clinicians ranked time constraints as the most significant barrier to information seeking due to work pressures (Flynn & McGuinness, 2010, p. 28). There are two possible reasons for the differences in the main barriers. First, in Namibia, or generally in Africa, people seem to be more people-oriented, as confirmed by some interviewees who said that they could not use information sources in front of patients, which indicates that they considered the feelings of their patients. Therefore, time is less important than people are. It is therefore possible that doctors in Africa might spend more time communicating with patients than clinicians in the West. Another possible explanation is that, although Namibia is a small country in terms of population, it has more than ten different languages, hence the high number of doctors who found language to be a major barrier.

Wilson's (1999) model of information-seeking behaviour, upon which this study is anchored, further notes that intervening variables, such as language issues, environment, and accessibility issues might hinder information seeking.

7.3 Factors affecting practising medical doctors at Katutura and Windhoek Central state hospitals

Which of the following have been problems for you in obtaining the information you need? (Please tick all that apply)

Table 7.1: Factors affecting information-seeking behaviour of medical doctors

Factor	N	%
Library not available in your hospital	34	47.9
Library is available but located very far	25	35.2
Inadequate resources in the library	28	39.4
Lack of information technology (mobile phones)	22	31.0
Language problems in communicating	39	54.9
Lack of patient's understanding of medical terms	37	52.1
Gathering patients' information from relatives	23	32.4
Lack of time to talk with patients	22	31.0
Missing patient's file	30	42.3
Inaccessibility of patient's file	18	25.4
Unorganised forms in patient's file	25	35.2
Missing form/incomplete information in patient's file	27	38.0

Lack of help from Medical Records staff	14	19.7
Too much information on the Internet	5	7.0
High cost of subscription to electronic journals	27	38.0
Lack of searching skills	8	11.3
No facility to communicate with other hospitals	21	29.6

A large number of respondents (54.9%) as shown in Table 7.1 indicated that language problems in communicating with patients/patients' relatives were affecting them in obtaining the information they needed. Questionnaire and interview results showed that the most common problem faced by medical doctors was the language barrier with patients who could not speak English. Katutura Hospital and Windhoek Central Hospital are referral hospitals receiving patients from all the 14 regions of Namibia (see Subsection 4.3.1). This important finding is explained in detail under Subsection 7.3.1.

The interviewed doctors, the majority of whom were non-Namibians, added that they had to use Namibian nurses as their interpreters for them to understand or to be understood by their patients. However, in some cases, patients' relatives acted as interpreters. Participants pointed out that there is a risk that these translators may transmit inaccurate information to the doctors. Hsieh (2003) cautions that although the medical interpreters (nurses) act as a neutral party, they often interfere with the content of the conversation and decide what is to be said and heard (2003).

In the follow-up interviews, the interviewees were asked to comment on the factors of language problems, misunderstanding of medical terms, lack of time to talk with patients, and missing patients' files, as they were directly linked to the patients. Below are the results.

7.3.1   Language problem in communicating with patients/ patients' relatives

Although this current study revealed that doctors' communication with patients was one of the most common forms of interpersonal communication that enabled them to obtain patient data (see Tables 6.12-6.14), most of the interviewees expressed dissatisfaction with their communication with patients for various reasons, including language issues.

Below is a cross-tabulation of language by nationality to see if nationality was a language-related factor according to the participants.

Table 7.2: Crosstabs of language problems by nationality

| | | Nationality | | Total |
		Namibian	Non-Namibian	
Language problem in communicating with patients/ patients' relatives	Count	22	16	38
	% within What have been problems for you in obtaining information you need(1)?	57.9%	42.1%	100.0%
	% within Nationality	100.0%	100.0%	100.0%
	% of Total	57.9%	42.1%	100.0%
Total	Count	22	16	38
	% within What have been problems for you in obtaining information you need(1)?	57.9%	42.1%	100.0%
	% within Nationality	100.0%	100.0%	100.0%
	% of Total	57.9%	42.1%	100.0%

It is noteworthy that 38 (53.5% of the 71) respondents ticked language barriers as a problem. Although this can be explained by the fact that a high number of the participants were non-Namibians, a relatively high number of Namibian doctors also cited language problems. It was surprising that there was no relationship between language barriers and nationality (*r = -.042, n = 70, p > .05*). This could be explained by the fact that small as the country is, Namibia has about eleven languages. The Namibian doctors at Katutura and Windhoek Central hospitals therefore were from across the country and their vernacular languages were clearly different from some of the patients who were visiting the hospitals. The questionnaire did not ask the participants to state their language groups. This may be a useful area of research in future studies.

All interviewees mentioned language as the biggest challenge. This was expected since a further analysis showed that the majority of interviewees were non-Namibian. The interviewees revealed that language problems prevented them from having proper communication with the patients. In addition, although English has become a medium of communication in Namibia, older patients are more comfortable with Afrikaans. An interviewee working at both Katutura and Windhoek noted:

> *Even if I am a Namibian, I do not speak all languages. Apart from that, patients do not understand medical terms and it is not easy to put them into our local languages. There is need to employ official translators.*

While the current study revealed that language is the main barrier to information seeking by medical doctors, some studies argue that time constraints are the number one barrier for medical doctors (Flynn & McGuinness, 2010; Green & Ruff, 2005). In Flynn and McGuinness' study of clinicians in Ireland, 89% of the clinicians ranked time constraints as the most significant barrier to information seeking due to work pressures (Flynn & McGuinness, 2010, p. 28). There are two possible reasons for the differences in the main barriers. Firstly, in Namibia, or generally in Africa, people seem to be more people-oriented, as confirmed by some interviewees who said they could not use information sources in front of patients as a sign that they considered the feelings of their patients. Therefore, time is less important than people. Doctors in Africa are therefore likely to spend more time communicating with patients than clinicians in the West. Another possible explanation is that, although Namibia is a small country in terms of

population, it has more than ten different languages, hence the high number of doctors who found language to be a major barrier.

Results have shown that language has a bearing on the information-seeking behaviour of doctors. This is in agreement with Wilson's (1996) model of information seeking, which states that intervening variables, such as demographic background, can either motivate or hinder information seeking.

7.3.2 Lack of patients' understanding of medical terms

Another factor raised by the participants was medical terminology. Thirty-seven (52.1%) of the participants indicated that lack of patients' understanding of medical terms affected their information seeking (Table 7.1). This was explained by some interviewees:

> *Even if I am a Namibian, I do not speak all languages. Apart from that, patients do not understand medical terms and it is not easy to put them into our local languages. There is need to employ official translators.*

Lack of awareness of health information on the part of patients was also highlighted by the interviewees as a barrier between doctors and patients when discussing treatment plans.

In agreement with this finding, Knapton (2014) reported in The Telegraph that more than half of patients do not understand medical terms. These findings are also in line with Wilson (1999), who states that intervening variables such as demographic background can either motivate or hinder information seeking.

7.3.3 Library not available

Libraries should act as an interface of access to the global wealth of information for practising medical doctors when they need information. The current study has revealed that the unavailability of libraries (47.9%) is another major factor that affects doctors' information-seeking behaviour. In agreement, Andualem, Kebede, and Kumie's (2013) study revealed that the unavailability of health information resources is one of the main reasons for poor health information-seeking behaviour among health professionals.

It is, however, noteworthy that a study by Nwezeh, Shabi, and Shabi (2011) revealed that only 18% of doctors at the Obafemi Awolowo University teaching hospitals complex in Nigeria utilised the existing hospital library resources; even those who used the library resources did so as a second resort. This shows that providing medical doctors with a library alone is not enough, but there is a need to market the library services. Davies (2007) argues that there is no need for doctors to travel to the library as they can access the information through electronic databases. This is partially in agreement with this current study, which showed that doctors preferred using personal collections or using the Internet at home. Davies further concurs that doctors do not have time to contact libraries as some of their information needs arise outside library opening hours. The development of information provision systems at Katutura and Windhoek Central hospitals should therefore consider these factors.

Another study by Bryant (2004) revealed a low usage of medical libraries by family doctors. According to Bryant, library use is influenced by interpersonal

256

relationships, as well as by the quality of the service. In agreement, this study found that Windhoek Central Hospital does not have a library, while the one at Katutura Hospital is not well-equipped, thus affecting quality. The information-seeking behaviour of doctors, as Wilson (1999) asserts in his model, was affected by the unavailability of libraries.

7.3.4 Missing patients' files

It is worrisome that a relatively high number of respondents indicated problems related to patients' files, which resulted in them seeing patients without the necessary documents. These included missing patient's file (42.3%), inaccessibility of patient's file (25.4%), unorganised forms in patient's file (35.2%), and missing form/incomplete information in patient's file (38.0%). This is worrisome because the patient's file is a primary source of information for medical doctors and they inform clinical decisions as discussed under Section 6.4.

It is noteworthy that the variables related to the patient's file were linked. These included missing patient's file, inaccessibility of patient's file, unorganised forms in patients' files, and missing form and incomplete information (see Table 7.1). This is an indication that these combined factors seriously affected the doctors' information seeking at the two hospitals. These factors, therefore, need serious attention. A study by Wegner and Rhoda (2013) found that incorrect documentation, incorrect folder numbers, incomplete records, and lack of storage space for medical records were serious issues in four South African hospitals.

The unavailability of patients' files has an effect on the information-seeking behaviour of medical doctors. This is in line with Wilson's model, which states that factors related to information source characteristics (accessibility and credibility), might motivate or hinder information seeking.

Table 7.3: Correlations of variables related to patient's file

Correlations

		Missing patient's file	Inaccessibility of patient file	Unorganised forms in the patient files	Missing form and incomplete information
Missing patient's file	Pearson Correlation	1	.544**	.495**	.315**
	Sig. (2-tailed)		0.000	0.000	0.008
	N	70	69	69	69
Inaccessibility of the patient file	Pearson Correlation	.544**	1	.445**	.538**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	69	69	69	69
Unorganised forms in the patient files	Pearson Correlation	.495**	.445**	1	.508**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	69	69	69	69
Missing form and incomplete information	Pearson Correlation	.315**	.538**	.508**	1
	Sig. (2-tailed)	0.008	0.000	0.000	
	N	69	69	69	69

7.3.5 Lack of time to talk with patients

Although the questionnaire survey rated this factor a bit lower than other factors, the interviewees emphasised time constraints in dealing with patients as a major factor. Some interviewees pointed out that even if they were able to explain

medical situation to patients, they could not because of time, since many other patients would be waiting for them.

Thirty-one percentage (31%) of the questionnaire respondents concurred that lack of time to talk with patients was a factor (See Table 7.1). Time constraints impeded the doctors from obtaining all the needed patient information. It should be noted that the two hospitals are referral hospitals, which deal with serious cases referred from all fourteen regions in the country. Therefore, time for communicating with patients is very limited. Periyakoil, Neri, and Kraemer (2015) concur that faced with complex situations, doctors may not have the time and/or training to talk with patients or their families in a constructive manner and may even avoid conversations with patients. According to the interviewees, sometimes patients were not cooperative in providing doctors with the needed patient data and sometimes this was done for social and cultural reasons. The interviewees also mentioned that some patients' relatives did not cooperate with the doctors in their effort to gather patient data for the same reasons, and that this affected the information seeking of doctors. There is evidence in literature that in some family-centred cultures, information is controlled and decision-making is often the responsibility of mature family members rather than the affected individual (Blackhall et al., 2001).

It is interesting to note that while the doctors found lack of time to talk with patients to be a factor affecting them in accessing information, under the 'Degree of satisfaction' heading they indicated that they were satisfied with their communication with patients (see Sub-section 8.3.2). This seems to be a

contradiction. However, this could be because doctors have many patients to talk to, such that their time is limited, but when they do communicate with their patients, they are satisfied. Wilson (1999) has noted in his model that factors related to one's social role (manager or mother), environment, and information source characteristics (accessibility and credibility), might motivate or hinder information seeking.

7.4   Conclusion

Factors are situations, conditions, or contexts that may affect the way one does his or her work. As information needs arise, there are situations that may affect medical doctors in their endeavour to search for the needed information.

This chapter presented factors affecting practising medical doctors at Katutura and Windhoek Central state hospitals in accessing and acquiring information for their medical practice, in line with Objective 4 of the study.

Although this current study revealed that doctors' communication with patients was one of the most common forms of interpersonal communication that enabled them to obtain patient data, most of the interviewees expressed dissatisfaction with their communication with patients for various reasons, including language issues.

Another factor is that of medical terminology. Patients do not understand medical terms, which is possibly why doctors recommended or suggested health education for patients as a way of improving communication with patients.

The results of the study indicate that some hospitals do not have libraries and where libraries exist, they may not be well equipped, thus negatively affecting the information-seeking behaviour of doctors. The study has also revealed another worrisome factor; that of missing patients' files, which results in doctors attending to patients without the necessary documents.

Lastly, the study has revealed that doctors do not have enough time to talk to patients, as there are so many of them to be attended to. This, in a way, affects not only the quality of their consultation, but their information-seeking behaviour as well. These findings concur with Wilson's (1996) model of information seeking, which states that factors related to one's social role (e.g. manager or mother), environment, and information source characteristics (accessibility and credibility) might motivate or hinder information seeking.

The next chapter focuses on the degree of satisfaction by doctors with regard to access to information resources and services, with a view to improving information services.

CHAPTER 8: DEGREE OF SATISFACTION OF PRACTISING MEDICAL DOCTORS AT THE TWO HOSPITALS WITH HEALTH INFORMATION RESOURCES AND SERVICES, AND AREAS IDENTIFIED FOR IMPROVEMENT

8.1   Introduction

Finding relevant information increases feelings of confidence, relief, satisfaction, and a sense of direction (Wilson 1999, p. 20). When the information seeker searches and successfully finds information, he or she will experience a sense of relief and satisfaction. González-González et al. (2007) assert that the satisfaction of information needs leads to good medical practice. If doctors are satisfied with the information resources and services, the patients are more likely to receive quality health services.

Upon its independence, the Government of Namibia, particularly the Ministry of Health and Social Services, adopted the primary health care approach with the aim of achieving health for all Namibians by 2030. This is only possible when doctors are satisfied with information sources and services provided to them to do their work.

This chapter is divided into two parts. The first part will address doctors' satisfaction level with information resources and services, while the second part will discuss doctors' suggestions on how to improve health information services.

The chapter addresses Objective 5 of the study, which sought to find out how health information service provision could be improved. The researcher deemed it necessary to find out the doctors' degree of satisfaction with information

resources and services provided at Katutura Hospital and Windhoek Central Hospital, which would help the researcher to understand the doctors' suggestions for improvement. With regard to the issue of satisfaction with information services, three issues are discussed; namely, communication with colleagues, communication with patients, and services provided by hospital libraries in the context of doctors.

The second part of the chapter provides suggestions on how to improve health information services for medical doctors in Namibia. The discussions in this chapter are also linked to Objectives 1, 2, and 3 of the study, as they bring out information needs, information-seeking behaviour, and information sources used by practising medical doctors at Katutura and Windhoek Central state hospitals.
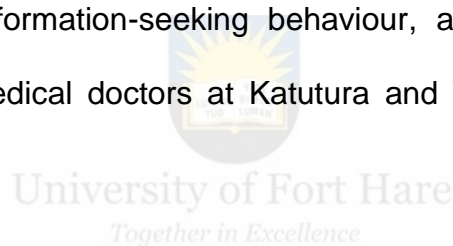
8.2   Core argument of the chapter

Doctors are highly satisfied with their communication with colleagues and patients. This agrees with the results of a number of studies, which found that colleagues are a preferred information source for physicians (Clarke et al., 2013; Coumou & Meijman, 2006; Callen et al., 2008). The finding, however, contradicts the findings of Andualem, Kebede, and Kumie (2013), which revealed that most doctors preferred formal health information resources (e.g. textbooks and manuals), compared to informal sources such as colleagues.

The doctors are not satisfied with the library services and information technology at the two hospitals. When library services are not satisfactory, the information

needs of doctors are not met, and when the information needs of medical doctors are not met, patients do not receive the best medical services. This finding is similar to that of Norbet and Lwoga (2012), which revealed that poor ICT infrastructure in Tanzania was a major barrier in information seeking.

The problem of missing files and incomplete information on patient data is also a major issue at the hospitals. The doctors are therefore not satisfied with the record-keeping process at the two hospitals.

According to Wilson's (1996) model of information-seeking behaviour, availability, accessibility, and credibility of information sources and resources might motivate or hinder information seeking. Therefore, the doctors' degree of satisfaction with the information service provision at Katutura and Windhoek Central hospitals is likely to affect their information-seeking behaviour and, consequently, their service to the patients.

8.3   Degree of satisfaction

This question was aimed at helping the researcher to identify areas that may need improvement in the information service provision for medical doctors at Katutura and Windhoek Central state hospitals.

Please indicate your degree of satisfaction in using the following information resources, services and other activities for gathering information.

Table 8.1: Degree of satisfaction in using information resources and services

Information resources	Not applicable		Dissatisfied		Neutral		Satisfied	
	N	%	N	%	N	%	N	%
Services provided by hospital library	23	32.4	19	26.8	17	23.9	2	2.8
Services provided by Medical Records department	7	9.9	21	29.6	28	39.4	7	9.9
Communication with other departments	0	0.0	17	23.9	26	36.6	26	36.6
Accessibility of the Internet	0	0.0	22	31.0	17	23.9	26	36.6
Communication with your colleagues	0	0	2	2.8	16	22.5	47	66.2
Communication with your patients	0	0	3	4.2	19	26.8	43	60.6
Communication with other hospitals and health centres	2	2.8	19	26.8	33	46.5	11	15.5
Daily / weekly / monthly meeting and seminars	4	5.6	7	9.9	21	29.6	34	47.9
Hospital information system	5	7.0	24	33.8	27	38.0	7	9.9
Attending conferences	2	2.8	24	33.8	27	38.0	12	16.9

Communication with colleagues (66.2%) and communication with patients (60.6%) topped the list of participants' satisfaction. These are further discussed below.

8.3.1   Communication with colleagues

Even though the majority (66.2%) of the participants indicated in the questionnaire that they were satisfied with their communication with colleagues, the interviewees said their communication with colleagues was hampered by the lack of information technology such as video conferencing and mobile phones. These sentiments are echoed by Norbet and Lwoga (2012) in their study, which also revealed that poor ICT infrastructure was one of the major barriers that inhibited physicians from seeking information. The interviewees complained that they always used their personal mobile phones whenever they wanted to communicate with colleagues and wished the Ministry could provide them with mobile phones for that purpose.

The findings of the current study concur with those of Clarke et al. (2013), which found that colleagues remain a preferred information source among physicians. Similar studies (Coumou & Meijman, 2006; Callen et al., 2008) also found that communication with colleagues is a treasured source of information and is often perceived as having a high impact on clinical decision-making. However, some studies (Andualem, Kebede & Kumie, 2013; Covell, Uman, & Manning, 1985) contradict this finding by showing that formal health information resources such

as textbooks and protocol manuals are preferred by doctors, compared to informal ones, such as colleagues.

The interviewees also revealed that they preferred to obtain information from their colleagues when information was needed quickly. Reliability, expert opinion, accessibility, timeliness, and urgency are some of the factors affecting doctors' information-seeking behaviour (Clarke 2006). The respondents also pointed out that their colleagues were more accessible compared to other information sources. This is also in line with Wilson's (1996) model of information-seeking behaviour, which states that factors such as information source characteristics (accessibility and credibility), might motivate or hinder information seeking.

8.3.2   Communication with patients

The patient was found to be a key information source for the doctors in all three clinical contexts, i.e. wards, outpatients, and emergency (see Tables 6.12-6.14). Table 6.15 is an extract of the most frequently used information sources and, although the patient's file and medical tests were ranked highly, asking the patient was the highest, even in the emergency department. This shows the importance of the patient as an information source. Gorman (1995, p. 732-3) notes that patient data is one of the information sources that can be accessed by medical doctors when they need information. This implies that there has to be communication with patients to get the patient data. Similarly, Elson, Faughnan, and Connelly (1997) concur that clinical decision-making is driven by information from patient data. This is also echoed by Thompson's (1997) study,

267

which found that doctors often relied on the patient's medical data as their information source. In the current study, patient data were found to be the most used source of information in all the clinical contexts (Table 6.15). This is not surprising, as doctors need information to be able to make good clinical decisions, hence the need for communication with their patients. Several other studies also concur that patient data is considered the most important information source (Ayatollahi et al., 2013; Al-Dousari 2009). This also concurs with Wilson's (1999) view that factors such as information source characteristics (accessibility and credibility), might motivate or hinder information seeking.

8.3.3 Services provided by hospital library

It is glaring that only 2.8% were satisfied with library services. However, this could be explained by the 32.4% who indicated that services provided by the hospital library were not applicable to them, most probably because there was no library at their hospital as has been discussed under various sections in the findings. One of the interviewees from Windhoek Central Hospital asked, '*Where is the library? I have been here nearly for a year now but I have not been to any library.*'

The interviewees complained about the library.

'*The library at Katutura Hospital is small and lacks up-to-date materials,*' said an interviewee from Katutura Hospital.

Another one said, '*Libraries are very far so I prefer using the Internet.*'

The majority of interviewees indicated that they were happy with their communication with other doctors and departments in the hospital. However, some pointed out that they had problems of missing files and incomplete patient data. Very few doctors are satisfied with the information services provided by the hospitals, which affects the information-seeking behaviour of doctors and their performance. Wilson (1999) states that intervening variables of an environmental nature might motivate or discourage information seeking.

8.4   Improving health information resources and services

This section addressed Objective 5 of the study, which was to find out how health information service provision may be improved. Suggestions for improvement were sought from the participants.

What do you think is the best way to develop and improve health information resources and services at Katutura and Windhoek Central state hospitals? (Please tick all that apply)

Table 8.2: Improving health information services

Ways to develop and improve health information services	Frequency	%
Health education for patients	54	76.1
Provide hospital library	46	64.8
Provide better-qualified staff in the Medical Records department	40	56.3

Provide better-qualified staff in the hospital library	27	38.0
Train doctors on the use of the Internet and Information Technology	39	54.9
Improve communication with other local hospitals	47	66.2
Improve communication with international hospitals and healthcare centres	46	64.8
Other: *Computerise medical patients' records*	3	4.2

The respondents indicated how health information service provision to the medical doctors could be improved. Top on the list was health education for patients (76.1%). Most suggestions were selected by more than half of the respondents. The lowest was providing better-qualified staff in the hospital library (38.0%), probably because there was no library at Windhoek Central Hospital for a qualified librarian to work in. Three respondents suggested that computerising patients' records would improve information service provision.

Mutale et al. (2013, online) stress that improving health information services is a priority, 'given its central role in the delivery of equitable and high quality health services.'

The doctors' suggestions for improving health information provision services are discussed in more detail below, taking into consideration the interview results and the literature review. The order of the subheadings is based on the ratings of the doctors.

8.4.1 Health education for patients

Majority (76.1%) of the survey participants indicated that health education for patients is needed as a way of improving health information services at Katutura and Windhoek Central state hospitals. Interview participants also emphasised that health education for patients is an important way of improving communication with patients. They also said that patients needed to be aware that obtaining information from people who lack medical knowledge might affect their diagnosis negatively. One area raised by the interviewees regarding education of patients was that patients needed to be taught that providing information about their medical history is critical to help doctors in their clinical decision-making.

Different medical professionals differ regarding the value of patient education (Nettles, 2005). Some have taken the position that patient education does not work because patients may be too ill to remember the information. However, Harris (1978) in an article entitled, 'Hospital-based Patient Education Programs and the Role of the Hospital Librarian', argues that 'it is the patient's legal right to know and to be informed about his/her medical situation'. On the other hand, a study by Hill, Waldron, Etherton-Beer, McPhail, Ingram, Flicker, and Haines (2014) on patient education programs revealed that patient education supported by staff training can reduce the rate of falls for older patients during patient rehabilitation. This is in agreement with the results of the current study, in which the doctors emphasised the need for patient education.

Some interviewees suggested that hospitals could provide booklets, leaflets, pamphlets, presentations, and posters in the hospitals and in all public places in local languages as a way of educating patients. Although they acknowledged the importance of patient education by doctors, the doctors stressed that they needed sufficient time with the patients to take the necessary patient data and undertake the necessary health inquiries. They therefore suggested better time-management by providing circulars in the outpatients department to outline the limits on the number of patients to be seen on a given day by a doctor. The Ministry of Health and Social Services (MOHSS) can also conduct seminars and lectures in schools and improve information provision on television and radio stations. Free information could also be provided by the MOHSS through e-mails, as well as through local newspapers.

If there is communication breakdown between doctors and patients, the information-seeking behaviour of doctors is affected, as Wilson (1999) notes in his model that intervening variables of demographic nature might motivate or discourage information seeking.

8.4.2   Communication with local and international hospitals

A high percentage of the questionnaire survey participants (66.2%) indicated that communication with other local hospitals was important in improving information services for medical doctors at the two hospitals. Another significant percentage (64.8%) of the participants indicated that communication with international hospitals and healthcare centres could also improve health information services at Katutura and Windhoek Central state hospitals. These

272

are discussed together because they both help to provide an environment that promotes the exchange of information among doctors.

Interview participants in this study suggested that hospitals should provide medical doctors with an environment that promotes the exchange of information by hosting seminars, workshops, and conferences in hospitals. This confirms Wilson's (1999) view that intervening variables of an environmental nature might motivate or discourage information seeking.

These suggestions by participants concur with the findings of Nylenna and Aasland's (2000) study, which showed that meetings and congresses were considered the most important clinical medical education activities for medical doctors. Similarly, a study by Bigdeli (2004) on information-seeking behaviour of medical professionals of Ahvaz University found that most doctors obtain information from information channels such as conferences to keep up-to-date with new information. However, in contrast, a later study by Bennett, Casebeer, Zheng, and Kristofco (2006) on doctors' information-seeking behaviour in using the Internet showed that the importance of meetings had declined since information could be accessed electronically. However, this does not imply that communication among hospitals is not important.

The unavailability of facilities to enable doctors to communicate, as Wilson (1999) notes, might motivate or discourage information seeking.

8.4.3   Provide hospital library

Another high percentage (64.8%) of the participants indicated that providing hospitals with libraries is another way of improving health information services at Katutura and Windhoek Central state hospitals. The interviewees suggested that the MOHSS should provide all hospitals with a library to improve the provision of information services. A study by Naeem, Ahmed, and Khan (2013) on primary care doctors concluded that their information-seeking behaviour was affected by the non-availability of medical libraries and medical librarians.

Participants proposed that the hospitals should also have online resources such as databases and journals. Respondents from Katutura Hospital recommended improving and updating the library collection. They suggested that the library resources should be updated by providing recent journals, medical databases, and professional librarians. One interviewee recommended:

'*Yes we have the Internet but more importantly we need to access databases. They are expensive; hence the hospital needs to subscribe for us.*'

Distance is also a key factor that inhibits doctors from visiting libraries (Bryant 2004). This sentiment was echoed by participants from Windhoek Central state hospital. Lorenzi (2009) suggest that hospital libraries should not operate on the periphery of the hospital system but should be brought closer to users.

The unavailability of libraries, as Wilson (1999) asserts, has a bearing on the information-seeking behaviour of practising medical doctors in Namibia.

8.4.4   Provide better-qualified staff in the hospital library

Participants in this study suggested provision of qualified librarians to improve information services. Those who participated in the interview suggested that the skills of the current library staff (where a library exists) should be improved by providing more training courses on how to provide current and timely health information. Another suggestion was that the librarian should be someone who understands medical language and that the quality of library staff performance needs to be improved.

A study by Bryant (2004) revealed that interpersonal relationships, as well as the quality of the service, influence the use of libraries by doctors. Lorenzi, (2009) recommends the involvement of library committee chairpersons, librarians, and other interested personnel in continuing education courses for hospital librarians, and the appointment of a library consultant or coordinator for hospital libraries. Providing qualified staff in hospital libraries is setting a good and conducive environment for doctors to search for information. This is in line with Wilson's (1996) model, which states that environmental factors might motivate or hinder information seeking.

8.4.5 Provide better-qualified staff in the medical records department

A reasonable percentage (56.3%) of the participants indicated that providing better-qualified staff in the medical records department is a way of improving information service at the two hospitals. The interviewees also provided some suggestions as to how the services provided by other departments in the hospital, including the medical records department, could be improved. They suggested coming up with a practical procedure to ensure that results from other

275

(investigative) departments are shared with them in good time. They indicated that the Health Information System (HIS) needs to be implemented effectively to reduce the time taken in sending and receiving patient results.

Questionnaire and interview results showed that the doctors used different kinds of ICT resources such as laptops and cell phones; however, these resources were their personal property. During the interviews, participants suggested that the hospital should not only provide Internet access, but should also subscribe to online medical journals and databases. They also added that it was necessary to develop a proper infrastructure for a digital health information system. The questionnaire results supported these suggestions, with the majority recommending the digitisation of all information sources as well as all operations that are conducted by the hospitals. Lorenzi (2009, p. 6) outline systematic steps in implementing electronic health records (EHRs) in ambulatory care: **Step 1: Decision -** There is need to identify experienced physicians to provide direction and encouragement for the project, collecting information, assessing workflows, understanding financial issues, and analysing benefits. **Step 2: Selection -** Determining whether to shift to an electronic health record system can be a very demanding process. **Step 3: Pre-implementation -** This involves communicating and involving staff and patients, redesigning workflows, establishing a project plan, timely training to meet the needs of medical practice, and having fun as a means of encouraging the introduction of the system. **Step 4: Implementation -** This involves engaging the patients who frequently visit about the value of EHRs, making changes and managing change, implementing

rapidly and supporting extensively, and encouraging the practice. **Step 5: Post-implementation -** The focus here is to continuously update, train, evaluate, and share information. The availability of an EHR would allow doctors to access information at any time, especially with the availability of electronic gadgets.

Providing better-qualified staff in the medical records department is another way of setting a good and conducive environment for doctors. This, again, is in line with Wilson's (1996) model, which states that factors of environmental nature might motivate or hinder information seeking.

8.4.6   Train doctors on the use of the Internet and information technology

Even though very few respondents selected lack of information search skills as a factor affecting medical doctors (see Section 7.3), more than half of the respondents suggested the training of medical doctors on the use of Internet and information technology as a way to improve health information sources and services. A study by Cullen, Clark, and Esson (2011) on evidence-based information-seeking skills of junior doctors entering the workforce revealed that most participants recalled the training they had received, but had not retained high-level search skills. It should be noted that these were junior doctors, while the current study involved practising medical doctors. If junior doctors who have recently graduated cannot retain their search skills, then it might be even more difficult for senior doctors to remember.

Despite the availability of many information sources that could provide medical doctors with information, lack of Internet search skills can be a hindrance to their

information seeking. Clarke et al. (2013) also identified lack of search skills as barriers to information seeking. The fact that 50% of the participants suggested training for doctors shows that they feel inadequate with their use of the Internet and information technology. McGowan and Berner (2004: online) stress that doctors should 'be able to critically review Web sites and the content of those sites for application in problem-solving; and be able to use the Web for patient education.'

Interviewees also proposed that doctors should not only be provided with Internet and ICT facilities, but also be trained on how to analyse information sources critically. They elaborated that ICT resources (emails and cell phones) would help them to communicate locally and internationally.

Training doctors on the use of ICT will give them skills to access information and this is in line with Wilson's (1996) model which states that factors related information source characteristics (accessibility and credibility), might motivate or hinder information seeking.

8.5 Conclusion

The study was set out to establish the information needs and information-seeking behaviour of practising medical doctors at the Katutura and Windhoek Central State hospitals in Namibia. The study revealed that medical doctors at Katutura and Windhoek Central hospitals need information for improving clinical decision-making, keeping up-to-date, improving their knowledge, and continuing education. The results of this study concur with Wilson's (1996) model of

information seeking, which states that information needs can be physiological, emotional, or cognitive. The results show that medical doctors use office telephones, Internet, personal collection, and meetings as sources of information, and that the basis for using these information sources is their availability, accessibility, timeliness, and trustworthiness.

The main factors affecting information-seeking behaviour of medical doctors are language problems, lack of patients' understanding of medical terms, unavailable or inadequate library resources, missing or inaccessible medical records, and lack of time.

This chapter was divided into two sections. The first section focused on the degree of the doctors' satisfaction with the information service provision at Katutura and Windhoek Central hospitals, while the second part of the chapter focused on the doctors' suggestions for the improvement of those services.

The study revealed that medical doctors are satisfied with their communication with colleagues. However, lack of information technology, such as video conferencing facilities and mobile phones hamper their information-seeking behaviour. This is in line with Wilson's (1996) model of information-seeking behaviour upon which this study was anchored.

The study also revealed that doctors are satisfied with their communication with patients. Patients are a key source of information for doctors in all three clinical contexts, i.e. wards, outpatients department, and emergency/casualty

279

department. However, lack of patients' understanding of medical terms also affected doctors' information-seeking behaviour.

Doctors suggested that to improve health information resources and services, there is a need for hospitals to provide health education to patients. Good communication between doctors and patients improves the information-seeking behaviour of doctors, while communication breakdown affects them. The doctors suggested that communication with local and international hospitals should be improved. Other suggestions included provision of hospital libraries, better-qualified staff in hospital libraries, better-qualified staff in the medical records department, and training doctors on the use of the Internet and information technology. This is in line with Wilson's (1996) model of information-seeking behaviour, which states that factors related to information source characteristics (accessibility and credibility), might motivate or hinder information seeking.

The next chapter gives a summary of the research findings, contribution of the study to new knowledge, and recommendations. It also presents proposed models of information needs and information-seeking behaviour of medical doctors.

CHAPTER 9: SUMMARY OF FINDINGS, CONTRIBUTION TO NEW THEORETICAL KNOWLEDGE AND RECOMMENDATIONS

9.1 Introduction

This study aimed to establish the information needs and information-seeking behaviour, and the information sources used by practising medical doctors at Katutura and Windhoek Central state hospitals to meet their medical needs.

The doctor's role and the context in which she or he operates, affect his or her information need, information seeking behaviour, and the information sources they use. Wilson's (1996) model of information seeking regards the role that an individual plays to be important in information seeking. The model further notes that even those who are knowledgeable in a specific area continue to search for information to keep up-to-date.

The most frequently mentioned information needs were improving clinical decision-making, keeping up-to-date, improving knowledge, and continuing education. The study also found that information sources and resources available and accessible have an effect on the patterns of information-seeking behaviour of medical doctors. Personal collections and the Internet are favoured because they are more easily accessible and can be used at any place and whenever necessary. Communication problems with patients/patient's relatives, lack of patients' understanding of medical terms, unavailability of libraries, and missing patients' files were found to be some of the major factors that affect information-seeking behaviour of doctors. The unavailability or lack of well-

functioning hospital libraries and Internet access is another major challenge, which discourages Namibian medical doctors from searching for information. These findings are in line with Wilson's model, which states that information source characteristics have an influence on the information needs and information seeking behaviour of information seekers.

Doctors expressed satisfaction with their communication with patients, although there are time constraints that may affect such communication. Medical doctors also pointed out that they are generally not satisfied with the library services in the hospitals. This is so because Windhoek Central Hospital does not have a library, while the one at Katutura Hospital is not well equipped.

The doctor's role and personality have an influence on his or her need for information. Wilson's (1996) model of information seeking regards the role that a person plays as important in information seeking. Wilson further notes that even those professionals who are knowledgeable in specific subject areas continue to search for information to keep up-to-date with their subject areas.

Based on the findings, literature, and Wilson's (1996) model of information-seeking behaviour, the researcher proposes some models of medical doctors' information seeking, in line with Objective 6 of the study. The chapter ends with recommendations to the Ministry of Health and Social Services, hospital management, ministerial libraries, and Namibia Libraries and Archives Services (NLAS) and suggestion for further research.

9.2   Summary of findings and relevant conclusions

This study is the first fact-finding study on information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central hospitals in Namibia. Data were gathered through a questionnaire and telephonic interviews. The two data-gathering techniques were used sequentially. The interviews were a follow up to the findings of the questionnaire survey. The questionnaire provided an overview of issues surrounding the information needs and information-seeking behaviour of practising medical doctors, while the interviews gave in-depth views of the participants around the same issues arising from the questionnaire.

Findings from the questionnaire were analysed using quantitative methods (IBM SPSS Version 25), while findings from the interviews were analysed using qualitative methods (content analysis). Triangulation was used to provide deep and comprehensive data about the information needs and information-seeking behaviour of medical doctors. Other contextual factors affecting information needs and information-seeking behaviour of medical doctors were also considered.

The study aimed to establish the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals. The information sources used by the doctors were embedded within the information needs and information-seeking behaviour. The key findings are summarised below in accordance with the aim and objectives of the study.

9.2.1 Information needs

The findings under this theme were meant to respond to Objective 1 of this study, which was to identify the information needs of doctors at Katutura and Windhoek Central state hospitals. The results of the questionnaire revealed that doctors require information for various reasons. The most frequently mentioned reasons were improving clinical decision-making, keeping up-to-date, improving knowledge, and continuing education.

The doctor's role and his or her personality have an influence on his or her need for information. This is in line with Wilson's (1996) model of information seeking, which regards the role that a person plays to be important in information seeking. Wilson further notes that even those professionals who are knowledgeable in specific areas continue to search for information to keep up-to-date with their subject area. The medical doctor, as the 'person in context' in this study, needs information to enhance clinical decision-making, keep up-to-date with, and improve knowledge, in the medical field.

9.2.2 Information-seeking behaviour and information sources used by practising medical doctors at Katutura and Windhoek Central state hospitals

The information-seeking behaviour of medical doctors is influenced by several factors. Apart from the context in which the doctor operates, this study also found that information sources and resources are linked to the patterns of information seeking by the medical doctors. The availability, accessibility, and

trustworthiness of the sources and resources is a major factor in the pattern of information use.

9.2.2.1 Information sources and resources used by medical doctors

Personal collections and the Internet are preferred when compared to libraries. This is because they are more easily accessible and can be used at any place and whenever necessary.

Unavailability or lack of well-functioning hospital libraries and Internet access is a major challenge, which discourages Namibian medical doctors from looking for information. The unavailability of a library at Windhoek Central Hospital and the fact that the one at Katutura Hospital is not functioning well is a serious concern. The doctors expressed that if they were to visit a library, they would prefer to find books as the most common type of information source in the library. Well-run and well-furnished libraries at both hospitals would therefore be a helpful information resource for the doctors.

With regard to ICT, the majority of the doctors use personal ICT resources, for example, the Internet, computers, and mobile phones, which they mainly access at their homes because the ones at the hospitals are not adequate. This shows the need and the importance of ICT resources in modern hospitals. The ICT resources are used because of their mobility, easy accessibility, and timeliness.

The patient (or patient's relative), is the primary source of information for doctors with regard to the patient data. Therefore, communication between the patient

285

and the doctor is important. However, sometimes doctors do not have much time for such interaction with patients.

Interpersonal communication among doctors as colleagues also helps doctors in making clinical decisions. There is a relationship between the respondents' work experience and the reasons for communicating with colleagues. The less experienced the doctor is, the more likely they are to communicate with more experienced colleagues. Interpersonal communication is mainly done using personal mobile phones. The doctors sometimes obtain information from ambulance staff, especially in the emergency department. Another way of interpersonal communication is attending regular meetings organised for information sharing and for professional development.

9.2.2.2 Patterns of information use by doctors in three clinical contexts

The information sources used by medical doctors vary based on the clinical context the doctor is operating in; namely, wards, outpatient department, and emergency/casualty department. Patient data (which includes asking the patient, using the patient's file, and ordering tests) are the most consulted information source in all three contexts compared to information resources (such as hospital library, medical database, Internet, etc.) and doctors' personal knowledge and experience. However, in the emergency department the doctor also relies heavily on his or her personal knowledge and experience. Information resources such as the library and the Internet are used more by doctors in the outpatients department and the wards than those in the emergency department.

The proposed clinical context information source model (CCISM) model below (Figure 9.2) clarifies these findings.

9.2.3 Factors affecting doctors' information-seeking behaviour

Language problems in communicating with patients/patient's relatives, lack of patients' understanding of medical terms, unavailability of libraries, and missing patients' files are some of the major factors that affect information-seeking behaviour of doctors.

It is noteworthy that no relationship was found between language barriers and nationality. This could be explained by the fact that although Namibia is a small country in terms of population, it is diverse, with about eleven languages. Lack of patients' understanding of medical terms is another barrier between doctors and patients when discussing treatment plans, which could be related to language barrier.

The problem of unavailability of libraries and the quality of resources in libraries is affecting Namibian medical doctors in accessing and acquiring needed information.

The problem of missing files of patients is another major factor that affects the medical doctors. This is compounded by unorganised forms in patients' files and missing or incomplete information in the files. As mentioned earlier, the patient's file is a primary source of information for medical doctors in making clinical decisions. It is noteworthy, though, that literature has shown that this problem is not peculiar to Namibia. These factors therefore need to be addressed.

Lack of time to talk is another major factor that was raised during the interviews. Doctors do not have enough time to explain diagnoses and treatment plans to patients.

9.2.1   Doctors' satisfaction with information resources and services

Medical doctors are mainly satisfied with their communication with their colleagues. However, their communication with colleagues is affected by the lack of information technology such as video conferencing facilities and mobile phones.

In addition, the doctors are satisfied with their communication with patients, although there are time constraints that may affect such communication.

The medical doctors are generally not satisfied with the library services in the hospitals. This is mainly because Windhoek Central Hospital does not have a library, while the one at Katutura Hospital is not well equipped. Furthermore, although the Internet is available at the hospitals, it is not accessible because there are no adequate facilities to access the Internet.

9.2.2   Suggestions for improving information provision for medical doctors

Doctors stressed the need to improve current health information provision in hospitals through providing health education to patients; setting an environment where doctors can communicate with other local and international hospitals; providing functional medical hospital libraries; training and providing qualified library staff; and training doctors on the use of the Internet and ICTs.

9.3 Contribution to new theoretical knowledge

The final objective of this study (Objective 6) was to develop conceptual models for information seeking of practising medical doctors at Katutura and Windhoek Central hospitals. Following Wilson's (1996) model of information seeking, this section proposes three information models for medical doctors based on the findings as well as the literature review. Even though these models are informed by other researchers' findings, they are new and, unlike other models, which focus on the patient's information seeking behaviour, the models of the current study focused on the information needs and information seeking behaviour of medical doctors in different contexts.

It should be noted that although the models look somewhat similar to some models (such as those of Al-Dousari, 2009, p. 332-333), the models in this study are based primarily on the findings of this particular study and are informed by Wilson's (1999) Information Behaviour Model and the wider literature review.

The proposed conceptual models take into consideration the information needs of practising medical doctors, the information-seeking behaviour and information sources used by practising medical doctors, the factors affecting medical doctors' information seeking, and the suggestions by the medical doctors. The barriers to effective information seeking, according to Wilson (1999), may be psychological, demographic, role-related, interpersonal, environmental, or information source characteristics. Three conceptual models arose from the study's findings. The first one shows that contextual and information source factors surrounding medical doctors interdependently affect their clinical

289

decision-making. The second model describes medical doctors' information seeking in three clinical contexts; namely, outpatients department, wards, and casualty/emergency department. The third model was developed to illustrate an overall picture of the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central hospitals.

9.3.1   Doctors' decision-making model (DDmM)

The results of this study have shown that the context (socio-cultural, organisational, and clinical) in which the doctor operates and the information sources and resources available affect their clinical decision-making. As a result, the researcher proposes a model that shows the inter-relationship of context, information sources, and clinical decision-making.
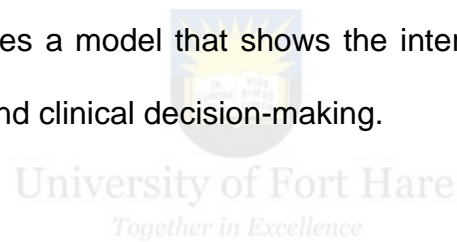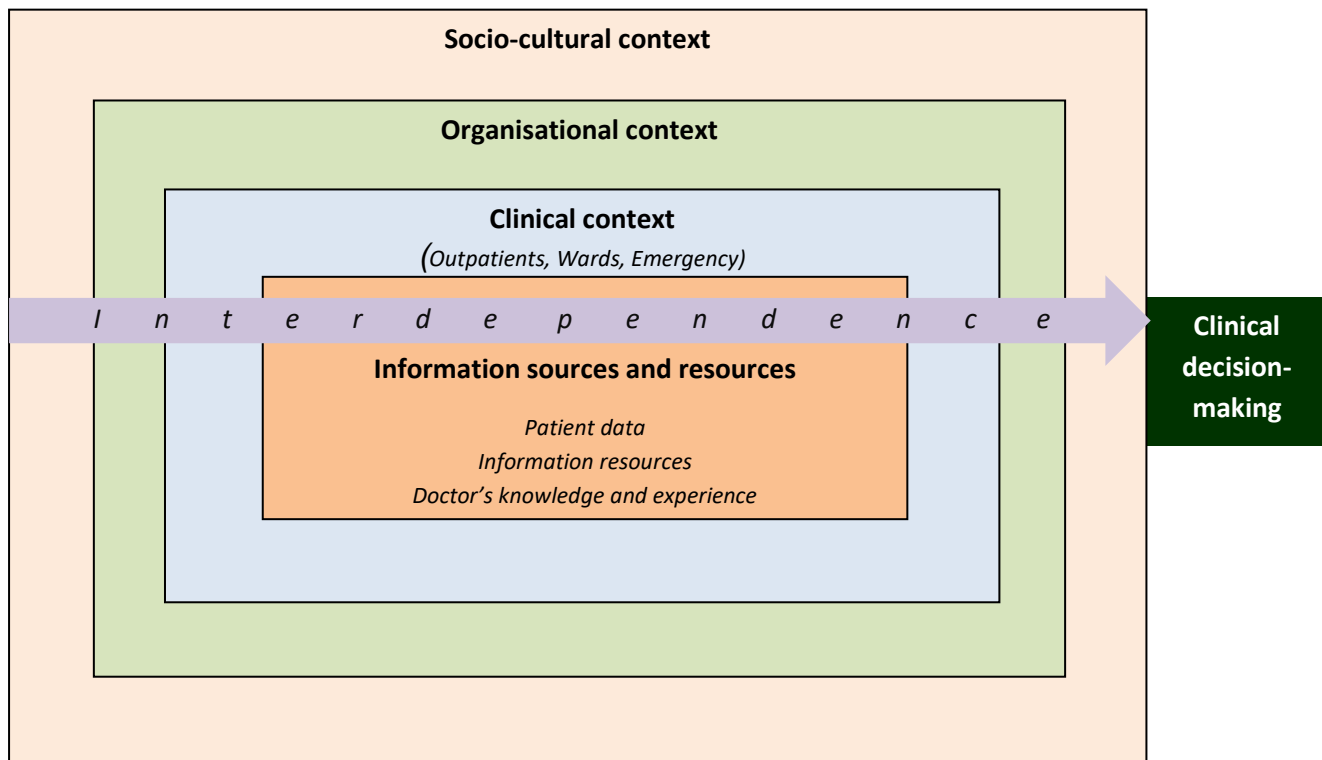
Figure 9.1: Doctors' decision-making model (DDmM)

(Source: Researcher, based on the findings of the study)

Explanation of the model

Doctors' clinical decision-making is influenced by a number of factors. First, the **context** within which the doctor is operating will determine how he or she makes decisions. These contexts include socio-cultural context, organisational context, and clinical context. *Socio-cultural context* involves factors such as language, cultural beliefs based on patient's age and gender, relationships between the patient and the relative who brings the patient (e.g. for authorisation of medical procedures), and the ability of the patient to communicate. *Organisational context* involves such factors as nature of hospital (e.g. referral or tertiary),

facilities available, communication systems in the hospital, hospital policies (such as number of patients per doctor, times of operation, etc.), and the general organisational environment. *Clinical context* refers to the clinical department the doctor is operating in (i.e. outpatients department, wards, or emergency department). It should be noted from the model that the clinical context operates within the organisational context, which in turn operates within the socio-cultural context. This is in line with Wilson's (1996) model, which begins with the 'person-in-context'.

Another factor that influences doctors' decision-making is the **information sources and resources** available. These include patient data (e.g. the patient, the patient's relative/s, or the patient's file, interaction with nurses, or other medical personnel), information resources (e.g. library, medical database, Internet), and the doctors' personal knowledge and experience. This is in line with Wilson's (1996) concept of 'intervening variables'. The context and the information sources and resources available work **interdependently** to influence the doctors' **clinical decision-making**. This is in line with what Wilson's 1996 model refers to as 'information processing and use' (Wilson, 1999, p. 257).

9.3.2 Clinical context information source model (CCISM)

The results of this study have shown that the use of information sources and resources depends on the clinical context in which the doctor is operating. The model below gives a picture of the degree of use of information sources and

resources in the three clinical contexts (outpatients, wards, emergency) based on the findings.

OUTPATIENTS

Patient data

Information resources

Doctor's knowledge and experience

WARDS

Patient data

Information resources

Doctor's knowledge and experience

EMERGENCY

Patient data

Information resources

Doctor's knowledge and experience

Clinical decision-making
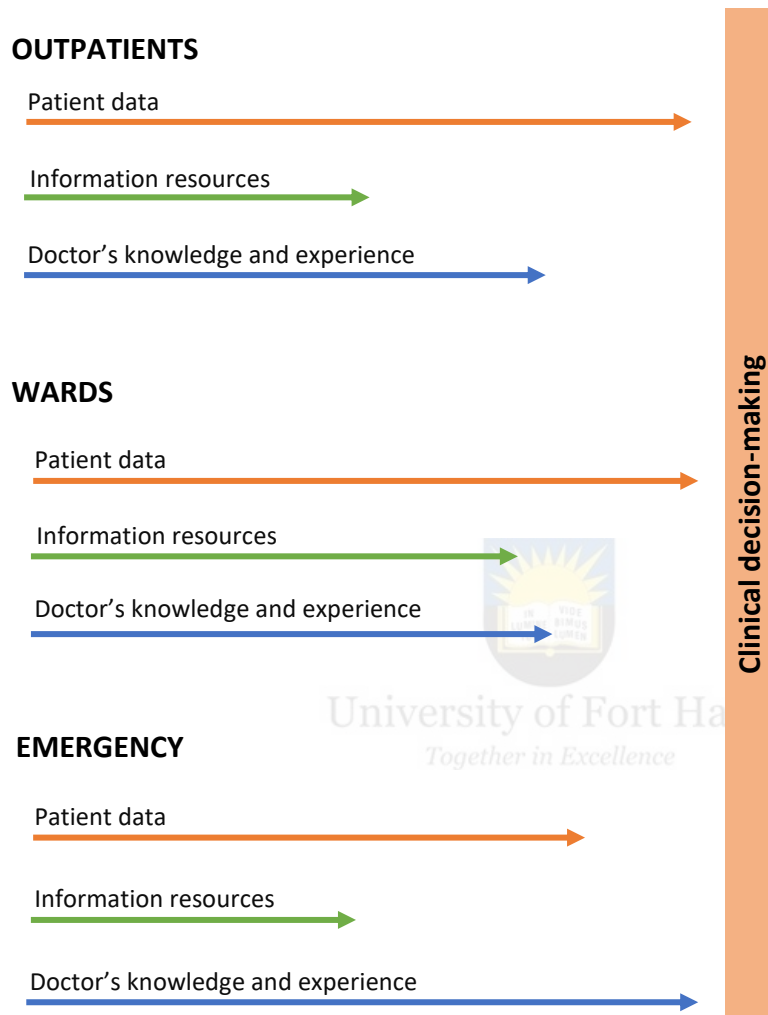
Figure 9.2: Clinical context information source model (CCISM)

(Source: Researcher, based on the findings of the study)

Although all three types of information sources and resources are critical in all three clinical contexts, their degree of use varies as shown in Figure 9.2.

In the **Outpatients** department, doctors refer to patients' data more than they refer to their personal knowledge and experience or information resources.

Information resources (such as library, books, or Internet) are used less. However, the doctor's personal knowledge and experience are used more than information resources.

The **Wards** seem to be a bit more relaxed for doctors, as they are able to refer to information resources a bit more. However, patient data remains the most used information source compared to information resources and doctors' personal knowledge and experience.

The **Emergency** department is quite different because of its urgent nature. Here, the doctor relies mostly on his or her personal knowledge and experience, although patient data plays a critical role in the clinical decision-making of an emergency doctor. The use of information resources in the emergency room is much less compared to the outpatients department and the wards.

This model is in agreement with Wilson's (1996) model, which asserts that the context of information need determines information-seeking behaviour.

9.3.3 Model of information needs and information-seeking behaviour of medical doctors (MINISBMD)

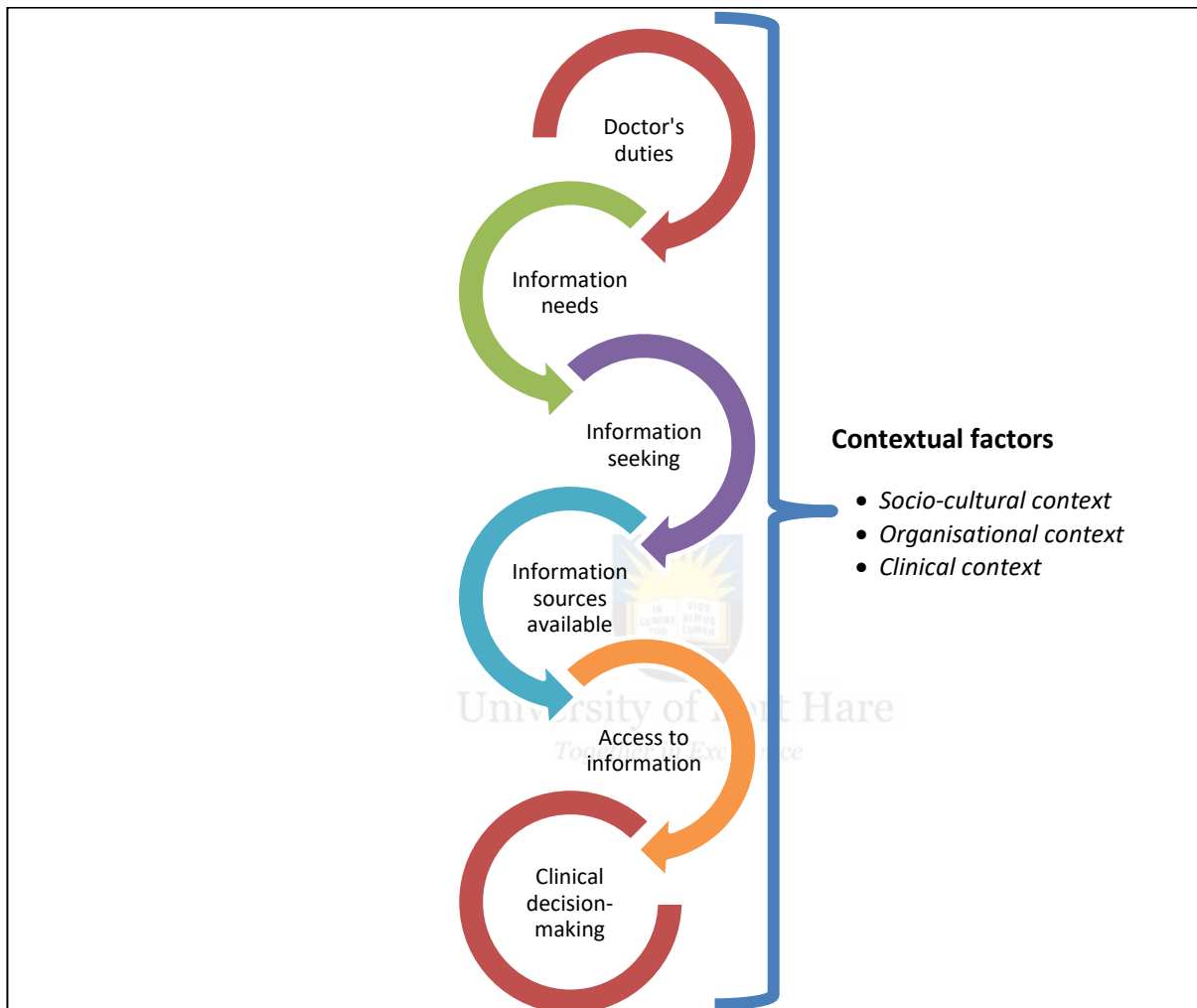Figure 9.3: Model of information needs and information-seeking behaviour of medical doctors (MINISBMD)

(Source: Researcher, based on the findings of the study)

The conceptual model of information needs and information-seeking behaviour of medical doctors presented in Figure 9.3 shows that the information-seeking behaviour of practising medical doctors is influenced by their **duties as medical**

doctors and the **information needs** that arise therefrom. In this study, medical doctors need information mainly to improve clinical decision-making; keep up-to-date; improve knowledge; and continue education. This is in line with Wilson's (1996) model of information-seeking behaviour, which states that the role a person plays at work or in life can influence the rise of a particular need. Doctors **seek information** from the **information sources available** to them. In this study, patient data (e.g. data from patient's file, patient, patient's relatives, or patient's nurses), information resources (e.g. libraries, personal collections, Internet, colleagues, medical databases, etc.) and the doctors' personal knowledge and experience were found to be the main information sources used by medical doctors for clinical decision-making. However, information sources should not only be available, but they should also be easily **accessible** to the doctors. For example, where a library is available, accessibility may involve ensuring that medical doctors have the necessary technical knowhow to use the resources in the library. This may involve appointing competent librarians who can train doctors on how to use library resources where a library is available. It also includes being able to understand the information, which will in turn help them in their **clinical decision-making**.

Contextual factors also have an impact on doctor's information needs and information-seeking behaviour and, in turn, clinical decision-making. As can be seen in the model (Figure 9.3), the contextual factors include the socio-cultural context (which includes language, age considerations, patient's gender, relatives who are allowed to give authorisation for medical procedures, etc.); the

organisational context (hospital environment, policies, etc.); and the clinical context (outpatients, wards, emergency). Wilson's (1999) MISB, concurs that there are contextual factors that affect an individual's information seeking process. Clinical decision-making is therefore influenced by whether the information needs of a medical doctor are met, and by the doctor's information-seeking behaviour, which is influenced by availability and accessibility of information sources.

9.4   Recommendations

The findings of the study have revealed that there is a need to improve the provision of health information at Katutura and Windhoek Central hospitals. It is not easy to change, but if change does not take place, medical services will be compromised, as doctors will struggle to make informed clinical decisions. For positive change to be experienced, it has to be supported by high-quality information resources and advanced technologies. To ensure this, some strategies are recommended to decision makers in the Ministry of Health and Social Services as well as the hospital management. In addition, recommendations are made for the Ministerial Libraries and to NLAS.

There is a need for the Ministry of Health and Social Services, hospital management, Ministerial Libraries, and NLAS to improve health information provision to doctors by taking the following steps:

9.4.1 Provision of well-equipped hospital libraries

NLAS, in collaboration with the Ministry of Health and Social Services (MOHSS), should provide well-equipped hospital libraries, with well-trained librarians. The libraries should have up-to-date electronic and physical information sources. Moreover, the performance appraisal of medical librarians should be linked to the information needs of medical doctors.

9.4.2 Effective health information system

It is evident from the results that doctors seek information from different information sources. The degree of information use varies depending on contextual factors that surround them. Introducing and implementing a system that has multiple functions and options will help doctors to access the different domains of information sources, which will in turn help with the smooth running of the health information provision service to doctors and doctors' clinical decision-making.

9.4.3 Effective health information provision plan

There is a need to establish and implement a clear information provision plan for practising medical doctors at Katutura and Windhoek Central hospitals. The MOHSS needs a comprehensive strategic plan for health information provision. For example, a strategic information plan could be put in place to include the exchange and communication with other healthcare providers in different health delivery systems, both primary and tertiary, locally and internationally. In doing so, the doctors need to be consulted. Involving the doctors in the strategic planning will help the doctors to own the plan and be willing to work with it.

9.4.4 Effective health information management

Improving health information provision at Katutura and Windhoek Central hospitals should include all sources and resources of information. Decision makers need to look at the situation from three information domains: doctors' knowledge and experience, patient data, and information resources. All these sources and resources need to be integrated to help doctors improve their clinical judgments. In addition, there is a need not only to improve the accessibility of patient data, but also to increase the knowledge resources needed by doctors. Doctors need to be provided with different information skills through workshops, including skills on how to search for information as well as to determine its authenticity. The quality of health information services can also be improved by training doctors in the utilisation of ICT resources and by ensuring that all records are sent to the library so that they can be accessible to all staff members. Library hours also need to be extended so that doctors can get information from the library when they need it.

9.4.5 Effective communication process

It is evident from the results that doctor-patient communication is a core element in seeking and obtaining information. The provision of well-trained medical translators in the two hospitals to act as professional intermediaries between doctors and patients who speak different languages is recommended.

In addition, decision-makers need to provide ICT equipment such as cell phones so that doctors can access the Internet as well as improve their communication with their medical colleagues.

9.4.6   Effective patient health information awareness

This can be done through the provision of free public seminars inside and outside the hospital. Another way is to create a health consumer website supported by the MOHSS. Social media such as Facebook and WhatsApp could also be used. Health information could be distributed through flyers, television, and radio. Librarians also need to assess doctors' information needs and to help them in searching for the required information. Doctors should also be encouraged to participate in journal clubs and other doctors' meetings to help them in accessing information sources according to their information needs. This can be achieved through training and assigning qualified staff in the hospital libraries.

9.4.7   Effective electronic resource environment

There is a need for the MOHSS to provide Internet facilities and access to online databases. Libraries need to digitise all health information sources found in hospital libraries. Data held by other departments such as laboratories, X-ray, physiotherapy, ICU, and pharmacy should be digitised.

9.5   Suggestions for further research

Since this was the first work on the information needs and information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central hospitals in Namibia, several issues emerged that require further investigation. Further research on health information service in Namibia should focus on the following:

- Information needs and information-seeking behaviour of practising medical doctors in all the regions of Namibia.

- Because Namibia is diverse in terms of cultures, with about eleven cultural groups, the researcher recommends a study on the effects of culture on doctors' information seeking. This will help the MOHSS in designing policies that help medical doctors to acquire information more easily.

- ICTs were found to be important in information provision for medical doctors. A study focusing on the role of ICTs in enhancing health information services in Namibia is recommended.

9.6 Contribution of the study to the field of Library and Information Science

This study has helped to establish the information needs and information-seeking behaviour of practising medical doctors and the extent to which medical doctors at Katutura and Windhoek Central hospitals use different information sources. The study has proposed some conceptual models that can help in improving information service provision for practising medical doctors in Namibia.

9.7 Conclusion

This chapter summarised the research findings. The study aimed to find out the information needs and the information-seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals in order to improve their medical information needs.

The study revealed that medical doctors need information for improving clinical decision-making, keeping up-to-date, improving knowledge, and continuing education. Personal collections and the Internet are the preferred information sources and resources compared to libraries because they are more easily accessible and can be used at any place and whenever necessary.

The study also revealed that language problems in communicating with patients/patient's relatives, lack of patients' understanding of medical terms, unavailability of libraries and missing patients' files are some of the major factors that affect information-seeking behaviour of doctors. Medical doctors indicated that they were satisfied with their communication with colleagues and patients. However, their communication with colleagues is affected by the lack of information technology such as video conferencing and mobile phones. The study concluded that there is no relationship between language barriers and nationality.

Doctors stressed the need to improve current health information provision in hospitals through providing health education to patients; setting an environment where doctors can communicate with other local and international hospitals; providing functional medical hospital libraries; training and providing qualified library staff; and training doctors on the use of the Internet and ICTs.

Three models of medical doctors' information seeking (Doctors' decision-making model, Clinical context information source model, and Model of information needs and information-seeking behaviour of medical doctors) were proposed in line with Objective 6 of the study. In the 'Doctor's decision-making model'

302

(DDmM), the **context** within which the doctor is operating determines the need for information and the sources to be used. In the 'Clinical context information source model' (CCISM), three types of information sources and resources (patients' data, personal knowledge, and experience) are critical in all contexts (outpatients, wards, and emergency). In the 'Model of information needs and information-seeking behaviour of medical doctor' (MINISBMD), the information-seeking behaviour of practising medical doctors is influenced by their **duties as medical doctors** and the **information needs** that arise therefrom.

Recommendations and suggestions for further research were made. NLAS and the Ministry of Health and Social Services, should provide well-equipped hospital libraries, with well-trained librarians. The MOHSS needs a comprehensive strategic plan for health information provision. The quality of health information services can also be improved by training doctors in the utilisation of ICT resources and by ensuring that all records are sent to the library so that they can be accessible to all staff members. In addition, decision-makers need to provide ICT equipment such as cell phones so that doctors can access the Internet as well as improve their communication with their medical colleagues.

The study has helped to establish the information needs and information-seeking behaviour of practising medical doctors and the extent to which medical doctors at Katutura and Windhoek Central hospitals use different information sources. It is the researcher's hope that this study will enhance the information service provision for practising medical doctors at Katutura and Windhoek

Central state hospitals and beyond, and that it will be a significant contribution

to the existing body of knowledge in library and information science.

References

Abbas, A. D., Abubakar, A. M, Omeiza, B., & Minoza, K. (2013). Information-seeking behavior and computer literacy among resident doctors in Maiduguri, Nigeria. *Ann Afr Med.,* 12(2), 115–9, doi:10.4103/1596-3519.112404

Aguolu, C. C., & Aguolu, I. E. (2002). *Libraries and information management in Nigeria.* Maiduguri: Ed-Linform Services.

AI-Dousari, E. (2009). Information needs and information seeking behaviour of doctors in Kuwait government hospitals: an exploratory study. (Doctoral Thesis), Loughborough University.

Ajuwon, G. A. (2006). Use of Internet for health information by physicians for patient care in teaching hospital in Ibadan, Nigeria. *Biomedical Digital Libraries*, 12, 3–12.

Al-Ansari, H. A., & Al-Enezi, S. (2001). Health sciences libraries in Kuwait: a study of their resources, facilities, and services. *Bull Med Libr Assoc*, 89(3), 287–205.

Albaum, G. (1997). The Likert scale revisited: an alternative. *Journal of the Market Research Society*, 39(2), 331–348.

Andualem, M., Kebede, G., & Kumie, A. (2013). Information needs and seeking behaviour among health professionals working at public hospital and health centres in Bahir Dar, Ethiopia. *BioMed Central Health Service Research*, 13, 534, doi: 10.1186/1472-6963-13-534.

Arraid, A. S. K. (2011). Information needs and information seeking behaviour of

   Libyan doctors working in Libyan hospitals. (PhD Thesis),

   Loughborough University.

Auckland City Libraries. (1995). *The customer's voice – a quest: a survey:*

   improvement of services to Maori. Auckland, New Zealand: Auckland

   City Libraries.

Ayatollahi, H., Bath, P. A., & Goodacre, S. (2013). Information needs of

   clinicians and non-clinicians in the emergency department: a qualitative

   study. *Health Information and Libraries Journal,* 30, 191–200.

Bell, J. (2005). *Doing your research project: a guide for first-time researchers in*

   education, health and social science. (4th ed.). Bershire: Open

   University Press.

Bennett, N. L., Casebeer, L. L., Zheng, S., & Kristofco, R. (2006). Information-

   seeking behaviours and reflective practice. *The Journal of Continuing*

   in the Health Professions, 26(2), 120–127.

Bertrand, I., & Hughes, P. (2005). *Media research methods: audiences,*

   institutions and texts. London: Palgrave McMillan.

Bigdeli, Z. (2004). Information-seeking behaviour: the case of specialists,

   residents, and interns at hospitals of Ahvaz University of Medical

   Sciences. (Summary of a research note delivered at the ISIC 2004

   conference, Dublin, 1-3 September 2004). *Information Research,* 10(1),

   summary 4. Retrieved 29 March 2016 from

   http://InformationR.net/ir/10-1/abs4)

Black, T. R. (1999). *Doing qualitative research in the social sciences: an integrated approach to research design, measurement and statistics.* London: Sage.

Blackhall, L. J., Frank, G., Murphy, S., & Michel, V. (2001). Bioethics in a different tongue: the case of truth-telling. *Journal of Urban Health*, 78, 59–71.

Bloor, M. (2006). *Keywords in qualitative methods: a vocabulary of research concepts.* London: Sage.

Boissin, F. G., Docsi, U., & Bernard, C. (2005). Information-seeking behaviour and use of the internet by French general practitioners: a qualitative study. *Health Information and Libraries Journal*, 22, 173–181.

Brennan, N., Edwards, S., Kelly, N., Miller, A., Harrower, L., & Mattick, K. (2014). Qualified doctor and medical students' use of resources for accessing information: what is used and why? *Health Information & Libraries Journal,* 31, 204–214.

British Medical Association. (2017). Doctors' titles explained. Retrieved 3 May 2018 from www.bma.org.uk

Bryant, A., & Charmaz, K. (2008). *The SAGE handbook of grounded theory*. London: SAGE.

Bryant, S. L. (2004). The information needs and information seeking behaviour of family doctors. *Health Information and Libraries Journal*, 21(2), 84–93.

Buckland, M. (1991). Information as thing. *Journal of the American Society for Information Science*, 42, 351–360. Retrieved 13 April 2015 from http://people.ischool.berkeley.edu/~buckland/thing.html

Callen, J. L., Buyankhishiq, B., & Mclntosh, J. (2008). Clinical information sources used by hospital doctors in Mongolia. *International Journal of Medical Informatics.* 77(4), 249–255.

Carr, R. (2006). What users want: an academic 'hybrid' library perspective. Retrieved 23 July 2014 from http://www.bodley.ox.ac.uk/librarian

Case, D. O. (2006). *Looking for information: a survey of research on information seeking, needs, and behaviour,* (2nd ed.). Bingley: Emerald Group Publishing.

Casebeer, L., Bennett, N., Kristofco, R., Carillo, A., & Centor, R. (2002). Physician internet medical information seeking and on-line continuing education use patterns. *The Journal of Continuing Education in the Health Professions*, 22, 33–42.

Chambliss M. L., & Conley, J. (1996). Answering clinical questions. *J Fam Pract.*, 43, 140–4.

Chen, C., & Hernon, P. 1982. *Information seeking: assessing and anticipating user needs.* New York: Neal-Schuman.

Chikonzo, A. C., & Aina, L. O. (2001). The information environment of veterinary researchers at the University of Zimbabwe. *International Information and Library Review*, 33(1), 97–111.

Chiware, E. R. T., & Dickson, A. L. (2008). Information needs and information seeking patterns of small, medium and micro enterprises in Namibia. *Information Development*, 24(1), 24–36.

Choo, C. W., & Auster, E. (1993). Environmental scanning: acquisition and use of information by managers. In M. E. Williams (Ed.), *Annual review of information science and technology,* (Vol. 28, pp. 279–314). Medford, NJ: Learned Information, Inc.

Clarke, M. A., Belden, J. L, Koopman, R. J., Steege, L. M., Moore, J. L., Canfield, S. M., & Kim, M. S. (2013). Information needs and information-seeking behaviour analysis of primary care physicians and nurses: a literature review. *Health Information & Libraries Journal*, 30, 178–190.

Cline, G. B., & Luiz, J. M. (2013). Information technology systems in public sector health facilities in developing countries: the case of South Africa. *Medical Informatics and Decision-making,* 13(13). Retrieved on 3 August 2007 from http://www.biomedicentral.com/1472-6947/13/13

Coumou, H. C. H., & Meijman, F. J. (2006). How do primary care physicians seek answers to clinical questions?: a literature review. *Journal of the Medical Library Association*, 94(1), 55–60.

Covell, D. G., Uman, G.C., & Manning, P. R. (1985). Information needs in office practice: are they being met? *Ann Intern Med,* 103(4), 596–9.

Crane, D. (1972). *Invisible colleges: diffusion of knowledge in scientific communities.* Chicago: University of Chicago Press.

Creswell, J. W. (2003). *Research design: qualitative, quantitative, and mixed methods approaches*, (2nd ed.). London: Sage.

Creswell, J. W. (2009). *Research design: qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.

Cullen, R., Clark, M., & Esson, R. (2011). Evidence-based information-seeking skills of junior doctors entering the workforce: an evaluation of the impact of information literacy training during pre-clinical years. *Health Information and Libraries Journal,* 28, 119–129.

Davies, K. (2007). The information-seeking behaviour of doctors: a review of the evidence. *Health Information and Libraries Journal,* 24(2), 78–94.

Davies, K. (2009). Quantifying the information needs of doctors in the UK using clinical librarians. *Health Information and Libraries Journal*, 26, 289–297.

Dee, C. R., Teolis, M., & Todd, A. D. (2005). Physicians' use of the personal digital assistant (PDA) in clinical decision-making. *Journal of the Medical Library Association,* 93(4), 480–486.

Dee, C., & Blazek, R. (1993). Information needs of rural physicians: a descriptive study. *B Med Lib Assn*, 81(3), 259–264.

Denzin, N. & Lincoln, Y. (2000). *Handbook of qualitative research,* (2nd ed.). London: Sage.

Dervin, B. (2003). From the mind's eye of the user: the sense-making qualitative quantitative methodology. In B. Dervin, L. Foreman-Wernet & E. Launterbach (Eds). *Sense-making methodology reader: selected writings of Brenda Dervin* (pp. 269–292). Cresskill: Hampton Press.

Easterby-Smith, M., Thorpe, R., & Lowe, A. (1997). *Management research: an introduction.* London: Sage.

Ellis, D. (1989). A behavioural approach to information retrieval design. *Journal of Documentation,* 45(3), 318–338.

Elson, R. B., Faughnan, J. G., & Connelly, D. P. (1997). An industrial process view of information delivery to support clinical decision-making: implications for systems design and process measures. *Journal of the American Medical Informatics Association,* 4(4), 266–278.

Ely, J. W., Osheroff, J. A., Chambliss, L., Ebell, M. H., & Rosenbaum, M. E. (1991). Answering physicians' clinical questions: obstacles and potential solutions. *Journal of the American Medical Informatics Association,* 12(2), 217–224. doi:10.1197/jamia.M1608

Eskola, E. (1998). University students' information seeking behaviour in a changing learning environment. *Information Research,* 4(2), Retrieved 20 March 2014 from

http://www.shef.ac.uk/~is/publications/infres/isic/eeskola.html

Fink, A. (2003). *The survey kit: how to sample in surveys.* London: Sage.

Flynn, M. G., & McGuinness, C. (2010). Hospital clinicians' information behaviour and attitudes towards the 'clinical informationist': an Irish survey. *Health Information and Libraries Journal,* 28, 23–32.

Formoso, G., Rizzini, P., Bassi, M., Bonfanti, P. Rizzardini, G., Campomori, A., & Mosconi, P. (2016). Knowledge transfer. What drug information would specialist doctors need to support their clinical practice?: results

of a survey and of three focus groups in Italy. *BMC Medical Informatics and Decision-making*, 16(115), 1–10.

Fors, M., Kohane, I., Long, W., & Moreno, A. (2002). The benefits and obstacles of implementing ICTs strategies for development from bottom-up approach. *Aslib Proc*, 54, 198–206.

Fraenkel, R. J., & Wallen, E. N. (2000). *How to design and evaluate research in education* (4th ed.). San Francisco: McGraw-Hill.

Frazer, L., & Lawley, M. (2000). *Questionnaire design and administration: a practical guide.* New York: Wiley.

Gavino, A. I., Ho, B. L. C., Wee, P. A. A., Marcelo, A. B., & Fontelo, P. (2013). Information-seeking trends of medical professionals and students from middle- income countries: a focus on the Philippines. *Health Information & Libraries Journal,* 30, 303–317.

General Medical Council (2006). Guidance for doctors: good medical practice. Retrieved 20 September 2016 from http://www.gmc-uk.org/guidance/good_medical_practice/GMC_GMP.pdf

Gillespie, D. F. (2008). Ethical issues in research. Retrieved 12 March 2014 from http://www.uncp.edu/home/marson/ethical_issues.html

González-González, A. I., Dawes, M., Sánchez-Mateos, J., Riesgo-Fuertes, R., Escortell-Mayor, E., Sanz-Cuesta, T., & Hernández-Fernández, T. (2007). Information needs and information-seeking behaviour of primary care physicians. *Annals of Family Medicine*, 5, (4) 345–352.

Gorman, G. E., & Clayton, P. (2005). *Qualitative research for the information professional: a practical handbook*. London: Facet.

Gorman, P. (1995). Information needs of physicians. *Journal of the American Society for Information Science,* 46*,* 737–254.

Gorman, P. (1999). Information seeking of primary care physicians: conceptual models and empirical studies. In T. D. Wilson & D. K. Allen (Eds), *Information behaviour: Proceedings of the second international conference on research in information needs, seeking and use in different contexts, 13/15 August 1998, Sheffield, UK,* (pp. 226–240). London: Taylor Graham.

Gorman, P. N. (2001). Information needs in primary care: a survey of rural and nonrural primary care physicians. *Medinfo*, 10(1), 338–342.

Green, A. (1990). What do we mean by user needs? *British Journal of Academic Librarianship*, 5(2), 65–78.

Green, M. L., & Ruff, T. R. (2005). Why do residents fail to answer their clinical questions?: a qualitative study of barriers to practising evidence-based medicine. *Acad Med*, 80(2), 176–82.

Grunig, J. E. (1989). Publics, audience and market segments: segmentation principles for campaigns. In C. Salmon (Ed.), *Information campaigns: balancing social values and social change* (pp. 199–228). Beverley Hills, CA: Sage.

Guba, E. G., & Lincoln, Y. S. (1998). Competing paradigms in qualitative research: In N. K. Denzin & Y. S. Lincoln (Eds). *The landscape of qualitative research: theories and issues*, (pp. 195–220). London: Sage.

Haidula, T. (27 January 2015). 'Katutura hospital overwhelmed'. *The Namibian.*

Hakim, C. (1997). *Research design: strategies and choices in the design of social research*. London: Routledge.

Hameed, S. A. (2008). Electronic medical record for effective patient monitoring database. (Proceedings of the International Conference on Computer and Communication Engineering, May 13-15, 2008, Kuala Lumpur, Malaysia), 373–378.

Harris, C. L. (1978). Hospital-based patient education programs and the role of the hospital librarian. *Bulletin of Medical Library Association*, 66(2), 210–217.

Harris, R. M., & Dewdney, P. (1994). *Barriers to information: how formal help systems fail battered women*. Westport, CT: Greenwood.

Hearst, M. A. (2009). *Search user interfaces*. Cambridge: CUP.

Heeks, R. (1999). The tyranny of participation in information systems: learning from development projects. *Development Informatics.* (Working Paper Series. Paper No. 4, Manchester: University of Manchester, Institute for Development Policy and Management).

Hernon, P. (1984). Information needs and gathering patterns of academic social scientists, with special emphasis given to historians and their use of U.S. government publications. *Government Information Quarterly,* 1, 401–429.

Hill, A-M., Waldron, N., Etherton-Beer, C., McPhail, S. M., Ingram, K., Flicker, L., & Haines, T. P. (2014). A stepped-wedge cluster randomised controlled trial for evaluating rates of falls among inpatients in aged care rehabilitation units receiving tailored multimedia education in

addition to usual care: a trial protocol. *Bulletin of Medical Journal,*

Retrieved 19 November 2014 from

https://bmjopen.bmj.com/content/4/1/e004195, doi: 10.1136/bmjopen-

2013-004195.

Horrocks, D. A. (1994). Access and accessibility at Gerald R. Ford library.

Government Information Quarterly: An International Journal of Policies,

Resources, Services, and Practices, 11(1), 47–65.

Hsieh, E. (2003). The communicative perspective of medical interpreting:

Studies in English Language and Literature, II, 11–24.

Hughes, B., Wareham, J., & Joshi, I. (2010). Doctors' online information needs,

cognitive search strategies, and judgments of information quality and

cognitive authority: how predictive judgments introduce bias into

cognitive search models. *Journal of the American Society for*

information Science and Technology, 61(3), 433–452.

Jacko, J. A., Sears, A., & Sorensen, S. J. (2001). Framework for usability:

healthcare professionals and the Internet. *Ergonomics*, 44, 989–1007.

Jackson, R., Baird, W., Davies-Reynolds, L., Smith, C., Blackburn, S., &

Allsebrook, J. (2007). The information requirements and information-

seeking behaviours of health and social care professionals providing

care to children with health care needs: a pilot study. *Health*

Information and Libraries Journal, 24(2), 95–102.

Järvelin, K., & Wilson, T. D. (2003). On conceptual models for information

seeking and retrieval research. *Information Research,* 9(1), paper 163.

Retrieved 29 July 2014 from http://InformationR.net/ir/9-1/paper163.html

Kale, R. (1994). Health information for the developing world. *British Medical Journal*, 309, 939–942.

Kandjeke, J. E. (2012). Follow-up report of the auditor-general on performance audit study on the Ministry of Health and Social Services: referral system for the financial years 2008, 2009 and 2010. *Report No. 1046*. Windhoek: Republic of Namibia.

Kapiriri, L., & Bondy, S. J. (2006). Health practitioners' and health planners' information needs and seeking behaviour for decision-making in Uganda. *International Journal of Medical Informatics*, 75(10-11), 714–721.

Khalid, H. (2000). The use of technology for house-keeping and bibliographic searching activities in university libraries of Saudi Arabia: the need for acceleration. *Library Review*, 49, 179–185.

Khudair, A. A., & Cooke, L. (2008). Healthcare personnel's use of e-information sources in Riyadh governmental hospitals. *Journal of Librarianship and Information Science,* 40(3), 207–217.

Knapton, S. (2014). Nearly half of patients do not understand medical language. *The Telegraph.* Retrieved 30 March 2015 from https://www.telegraph.co.uk/news /health/news/10909421/Nearly-half-of-patients-do-not-understand-medical-language.html

Korb, K. (2013). Calculating reliability of quantitative measure. Retrieved from

    16 June 2017 http://korbedpsych.com/LinkedFiles/CalculatingRe

    liability.pdf

Kristiansen, S., Kimeme, J., Mbwambo, A., & Wahid, F. (2005). Information

    flows and adaptation in Tanzanian cottage industries. *Entrepreneurship*

    and Regional Development, 17(5), 365–388.

Kuhlthau, C. (1993). *Seeking meaning: a process approach to library and*

    information services. Norwood: Ablex.

Kumar, R. (1999). *Research methodology: a step by step guide for beginners.*

    London: Sage.

Lalazaryan, A., & Zare-Farashbandi, F. (2014). A review of models and

    theories of health information seeking behavior. *International Journal of*

    Health Systems and Disaster Management, 2(4), 193-203. Retrieved

    19 May 2019 from http://www.ijhsdm.org/article.asp?issn=2347-

    9019;year=2014;volume=2;issue=4;spage=193;epage=203;aulast=Lala

    zaryan

Lapan, S., & Quartaroli, M. (Eds). (2009). *Research essentials: an introduction*

    to designs and practices. San Francisco: Jossey-Bass.

Lappa, E. (2005). Undertaking an information-needs analysis of the

    emergency-care physician to inform the role of the clinical librarian: a

    Greek perspective. *Health Information and Libraries Journal*, 22(2),

    124–32.

LeCompte, M. D., & Schensul, J. J. (1999). *Designing and conducting*

    ethnographic research. London: AltaMira Press.

Lee, J.-S., & Cho, H. (2011). Factors affecting information seeking and evaluation in a distributed learning environment. *Educational Technology & Society*, 14(2), 213–223.

Lee, P. J. (2013). The information needs of clinicians: a study of the Doctors Nova Scotia Clinical Library. *JCHLA/JABSC*, 34, 159–163.

Liebenau, J., & Backhouse, J. (1990). *Understanding information: an introduction*. London: MacMillan.

Lorenzi, N. M. (2009). Role of the hospital library within the hospital system. *Bull. Med. Libr. Ass.* 57(2), 183–199.

Lund Research Ltd. (2012). Purposive sampling. Retrieved from Laerd Dissertation: http://dissertation.laerd.com/purposive-sampling.php

Lwoga, E. T., & Matovelo, D. S. (2005). An assessment of the role of TV broadcasting in dissemination of health information in Tanzania. *Tanzania Journal of Health Research,* 7(2), 98–103.

Mabhiza, C. (2016). An investigation of the information seeking behaviours of veterinary scientists in UNAM. (Unpublished thesis), University of Namibia, Windhoek.

Mabhiza, C., Shatona, M., & Hamutumwa, N. (2012). Information seeking behaviours of the faculty of economics and management sciences, University of Namibia, In M. Ilvonen, P. Helminen, J. Ndinoshiho, & O. Sisatto, (Eds). *Empowering people: collaboration between Finnish and Namibian university libraries* (pp. 79–99). Tampere: Tampere University Press.

Mann, T. (2005). Survey of library user studies. Retrieved 22 July 2014 from

http://www.guild.2910.org/google.htm

Marshall, J. G. (1992). The impact of the hospital library on clinical decision-

making: the Rochester study. *Bulletin of the Medical Library*

Association, 80, 291–301.

Matsveru, D. (2013). Information needs and information seeking behaviour of

Namibian pastors. (Master's thesis), University of Namibia.

Matsveru, D., Nengomasha C., & Yule W. (2014). A framework for setting up

pastoral information services in Namibia. *Journal for Studies in*

Humanities and Social Science, 3(1-2), 99–117.

McGowan, J., & Berner, E. S. (2004). Proposed curricular objectives to teach

physicians competence in using the world wide web. *Academic*

Medicine, 79(3), 236–240.

Mchombu, K. (2012). An investigation into the information needs for poverty

eradication at Greenwell Matongo in Katutura, Windhoek, in the context

of the millennium development goals (MDGs). *Journal for Studies in*

Humanities and Social Sciences, 1(3), 75–92.

Mendes, Á., Abreu, L., Vilar-Correia, M. R., & Borlido-Santo, J. (2017). That

should be left to doctors, that's what they are there for!: exploring the

reflexivity and trust of young adults when seeking health information.

Health Communication, 32(9), 1076–1081.

Meyers, E. M., Nathan, L. P., & Saxton, M. L. (2007). Barriers to information

seeking in school libraries: conflicts in perceptions and practice.

Information Research, 11(2). Retrieved 30 January 2015 from

http://informationr.net/ir/12-2/paper295.html

Ministry of Health and Social Services (2002). Rules relating to improper conduct or misconduct by a medical practitioner. *Medical and Dental Professions Act, 1993: Government Notice No. 197.*

Ministry of Urban and Rural Development [MURD]. (2017). Map of Namibia. Retrieved 23 July 2014 from www.murd.gov.na/khomas-local-region-latest

Mnubi-Mchombu, C., Mostert, J., & Ocholla, D. (2009). Information needs and information seeking behaviour of orphans and vulnerable children and their caregivers in Okahandja, Namibia. *Africa Journal of Library, Archives & Information Science,* 19(1), 39–52.

Morse, J. (2005). Evolving trends in qualitative research: advances in mixed method design. *Qualitative Health Research,* 15(5), 583–585.

Murugan, B. O. S., & S. Allysornam, S. (2011). Information needs and information-seeking behaviour of allopathic medical practitioners in Tirppur District in Tamilnadu, India. *Library Philosophy and Practice.* Retrieved 20 August 2017 from http://unllib.unl.edu/LPP/

My Namibia. (2013). Katutura hospital. Retrieved 4 February 2015 from https://www.my.na/b/283/windhoek-central-hospital/

Naeem, A. B., Ahmed, S., & Khan, A. (2013). Information seeking in primary care: a survey of doctors working in remote government health facilities in Pakistan.

Nel, M., & Fourie, I. (2010). An exploratory study of the information behaviour of veterinary practitioners in South Africa. *Mousaion,* 28(2), 107–133.

Nettles, A. T. (2005). Patient education in the hospital. *Diabetes Spectrum*, 18(1), 44–48.

Neuman, W. L. (2011). *Social research methods: qualitative and quantitative approaches*. Needham Heights: Ally & Bacon.

Niedźwiedzka, B. (2003). A proposed general model of information behaviour. *Information Research*, 9(1) paper 164. Retrieved 20 August 2015 from http://InformationR.net/ir/9-1/paper164.html

Norbet, G. L., & Lwoga, E. T. (2012). Information seeking behaviour of physicians in Tanzania. *Information Development.* Retrieved 22 July 2014 from http://ir.muhas.ac.tz:8080/jspui/bitstream/123456789/960/1/lwoga_gad au_information%20development%20article_09072012_online.pdf

Nwafor-Orizu, O. E., & Onwudinjo, O. T. U. (2015). Availability and use of health information resources by doctors in teaching hospitals in South East Nigeria. *Information and Knowledge Management,* 5(9), 102.

Nwezeh, C. M. T., Shabi, O. M., & Shabi, I. N. (2011). Information-seeking behavior of doctors at the Obafemi Awolowo University Teaching Hospitals Complex, Ile Ife, Osun State, Nigeria. *Journal of Hospital Librarianship,* 11(2). Retrieved 3 April 2015 from http://dx.doi.org/10.1080/15323269.2011.558369

Nyam, S. S., Akawe, M. N., & Tyonum, N. M. (2015). Information needs and seeking behaviour of medical students, Benue State University, Makurdi. *IJIRD*, 4(11), 158–163.

Nylenna, M., & Aasland, O. G. (2000). Primary care physicians and their information-seeking behavior. *Journal of the Norwegian Medical Association*, 18, 9–13.

Ocheibi, J. A., & Buba, A. (2003). Information needs and information gathering behaviour of medical doctors in Maiduguri, Nigeria. *Journal of Educational Media and Library Sciences,* 40(4), 417–427.

Osheroff, J. A., Forsythe, D. E., Buchanan, B. G., Bankowitz, R. A., Blumenfeld, B. H., & Miller, R. A. (1991). Physicians' information needs: an analysis of questions posted during clinical teaching. *Annals of Internal Medicine*, 114, 576–581.

Peck, M. (2011). Age-related differences in doctor-patient interaction and patient satisfaction. *Current Gerontology and Geriatrics Research*, 2011, Article ID 137492, Chapter 8. Retrieved 17 February 2018 from http://dx.doi.org/10.1155/2011/137492

Periyakoil, V. S., Neri, E., & Kraemer, H. (2015). No easy talk: a mixed methods study of doctor reported barriers to conducting effective end-of-life conversations with diverse patients. *PLoS One,* 10(4). doi:10.1371/journal.pone.0122321

Pickard, A. J. (2007). *Research methods in information*. London: Facet.

Podichetty, V. K., Booher, J., Whitfield, M., & Biscup, R. S. (2006). Assessment

of Internet use and effects among healthcare professionals: a cross

sectional survey. *Postgrad Medical Journal*, 82, 274–279.

Prakasan, P. M. (2013). Information needs and use of healthcare

professionals: international perspective. *Journal of Library &*

Information Technology, 33(6), 465–473.

Ramos, K., Linscheid, R., & Schafer, S. (2003). Real-time information-seeking

behavior of residency physicians. *Family Medicine,* 35(4), 257–260.

Reams, P., & Twale, D. (2008). The promise of mixed methods: discovering

conflicting realities in the data. *International Journal of Research and*

method in education, 31(2), 133–142.

Reaves, C. C. (1992). *Quantitative research for the behavioural sciences*.

Oxford: John Wiley & Sons.

Rather, M. K., & Ganaie, S. A. (2018). Information seeking models in the digital

age. In M. Khosrow-Pour, *Encyclopedia of information science and*

*technology, (*pp. 4515-4527). Hershey: IGI Global Retrieved 29 April

2020 from http://www.igi-global.com

Reed, G. (2007). Barriers to successful EHR implementation. *EHR Scope*, 88–

91.

Republic of Namibia (2004). *Namibia vision 2030: prosperity, harmony, peace*

and political stability. Windhoek: Office of the President.

Rertz, J. M. (2004). The online dictionary for library and information science.

Retrieved 10 May 2018 from http://www.abc-

clio.com/ODLIS/odlis_i.aspx

Research Consortium. (2008). The shortage of medical doctors in South Africa: scarce and critical skills research project. (Research commissioned by Department of Labour, South Africa).

Ronald, D., & Wicks, D. A. (2009). A conversational model for qualitative research: a case study of clergy and religious knowledge. Retrieved 20 September 2017 from

http://faculty.kent.edu/drolad1/RAILS_5_2009.pdf

Simon, J. L., & Burstein, P. (1985). *Basic research methods in social sciences,* (3rd ed.). New York: Random House.

Singh, R. K. (2012). Information seeking behaviour of medical practitioners: a case study. *International Journal of Information Research*, 2(1), 28–43.

Smith, C., Van Velthoven, M. H., Truong, N. D., et al. (2020). How primary healthcare workers obtain information during consultations to aid safe prescribing in low-income and lower middle-income countries: a systematic review. *BMJ Global Health,* 5(4). doi: 10.1136/bmjgh-2019-002094.

Smith, K. G. (2008). *Academic writing and theological research: a guide for students.* Johannesburg: South African Theological Seminary Press.

Smith, M., & Feied, C. (1999). The emergency department as a complex system. Retrieved 20 September 2015 from

http://www.necsi.edu/projects/yaneer/emergencydeptcx.pdf

Sperber, D., & Wilson, D. (1995). *Relevance: communication and cognition* (2nd ed.). Oxford: Blackwell.

Spink, A., & Cole, C. (2007). Information behaviour: a socio-cognitive ability. *Evolutionary Psychology*, 5(2), 257–274.

Stausberg, J., & Uslu, A. M. (2008). Value of the electronic patient record: an analysis of the literature. *Journal of Biomedical Informatics*, 41(4), 675–682.

Strother, E. A., Lancaster, D. M., & Gardiner, J. 1986. Information needs of practising dentists. *Bull. Med. Libr. Assoc.* 74(3), 227–230.

Struwig, F. W., & Stead, G. B. (2001). *Planning, designing and reporting research*. Cape Town: Longman.

Tan, E. L., Stark, H., Lowinger, J. S., Ri~gland, R. W., & Pearson, S. A. (2006). Information sources used by New South Wales cancer clinicians: a qualitative study. *Internal Medicine Journal*, 36, 711–717.

Tashakkori, A., & Teddlie, C. (2003). *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, CA: Sage.

Team Namibia. (2013). Katutura hospital. Retrieved 22 April 2015 from http://www.teamnamibia.com/b/279/katutura-hospital/

Tenopir, C., King, D. W., Clarke, M. T., Msis, K. N., & Zhou, X. (2007). Journal of reading patterns and preferences of paediatricians. *Journal of Medical Library Association*, 95(1), 56–63.

The Electives Network, 2015. Retrieved 10 May 2016 from https://electives.net/photos/hospitals/3488/main.jpg

The Namibian. July 13, 2018. Foreign experts should not overstay – Ngimtima. www.namibian.com.na

Thompson, M. L. (1997). Literature review: characteristics of information

    resources preferred by primary care physicians. *Bull Med Libr Assoc*,

    85, 187–192.

Tjingaete, F. (1998). *Performance audit report of the Auditor General on the*

    Ministry of Health and Social Services: the referral system. Windhoek:

    Government Printers.

TrioTree Technologies (2018). Healthcare: primary, secondary and tertiary.

    Retrieved 15 January 2018 from http://triotree.com/blog/healthcare-

    primary-secondary-and-tertiary-brief-description/

Tumwikirize, W. A., Ogwai-Okeng, J. W., Vernby, A., Anokbonggo, W. W.

    Gustafesson, L. L., & Lundborg, C. L. (2009). Access and use of

    medicines information sources by physicians in public hospitals in

    Uganda: a cross-sectional survey. *African Health Science,* 8(4), 220–

    226.

Tunde, O. K. (2016). Information behaviour of medical faculty in the tertiary

    health institutions in Kwara State Nigeria, (Unpublished Thesis),

    University of KwaZulu-Natal, South Africa.

Umesha, U., & Chandrashekara M. (2013). Information seeking and searching

    behaviour of dental science professionals in Karnataka. *Journal of*

    Library & Information Technology, 33(2), 83–86.

UNESCO (2017). Communication and information: freedom of information.

    Retrieved 10 May 2018 from

    http://www.unesco.org/new/en/communication-and-

    information/freedom-of-expression/freedom-of-information/

Ur, R. S., & Ramzy, V. (2004). Internet use by health professionals at the Health Sciences Centre of Kuwait University. *Online Information Review,* 28(1), 53–60.

Vali, K. S., & Esmail, S. M. (2014). A study of information needs and information seeking behavior of faculty in Government medical colleges of Karnataka. *International Journal of Library Science and Research*, 4(4), 51–56.

Wang, S. J., Middleton, B., Prosser, L. A., Bardon, C. G., Spurr, C. D., Carchidi, P. J., Kittler, A. F., Goldszer, R. C., Fairchild, D. G., Sussman, A. J., Kuperman, G. J., & Bates, D. W. (2003). A cost-benefit analysis of electronic medical records in primary care. *American Journal of Medicine,* 114(5), 397–403.

Watts, C., & Ibegbulam, I. (2006). Access to electronic healthcare electronic information resources in developing countries: experiences for the medical library, College of Medicine, University of Nigeria. *IFLA Journal*, 32, 54–61.

Wegner, L., & Rhoda, A. (2013). Missing medical records: an obstacle to archival survey-research in a rural community in South Africa. *SA Journal of Physiotherapy*, 69(2), 15–19.

Welman, C., Kruger, F., & Mitchell, B. (2005). *Research Methodology,* (3rd ed.). Cape Town: Oxford University Press.

Wilcox, C. M., Heudebert, G., Klapow, J., Shewchuk, R., & Casebeer, L. (2001). Survey of primary care physicians' approach to gastroesophageal reflux disease in elderly patients. *The Journal of*

Gerontology: Medical Sciences, 56a(8), 514–517. Retrieved 15

January 2018 from https://www.ncbi.nlm.nih.gov/pubmed/11487605

Wilson, P., Glanville, J., & Watt, I. (2003). Access the online evidence base in

general practice: a survey of the Northern and Yorkshire region. *Health*

Information and Libraries Journal, 20(3), 172–178.

Wilson, T. D. (1981). On user studies and information needs. *Journal of*

Documentation, 37(1), 3–15.

Wilson, T. D. (1999). Models in information behaviour research. *Journal of*

Documentation, 55(3), 249–270.

Wilson, T. D. (2000). Human information behaviour*. Informing Science*, 3(2),

49–56.

Wilson, T. D., & Walsh, C. (1996). *Information behaviour, an interdisciplinary*

perspective. Sheffield: University of Sheffield, Department of

Information Studies. Retrieved 22 July 2014 from:

http://informationr.net/tdw/publ/infbehav/

World Health Organization (2006). The world health report 2006: working

together for health, Geneva, Switzerland.

Wyatt, J. C., & Sullivan, F. (2005). ABC of health informatics: what is health

information? *British Medical Journal*, 331(7516), 566–568.

Wynne, A. T., & Lyne, M. C. (2004). Rural economic growth linkages and small

scale poultry production: a survey of producers in Kwazulu-Natal.

Agreko, 43(1), 1–22.

Younger, P. (2010). Internet based information seeking behaviour amongst doctors and nurses: a short review of the literature. *Health Information and Libraries Journal*, 27(1), 2–10.

Zeng, Q, & Cimino, J.J. (2000). Providing multiple views to meet physician information needs. In: *Proceedings of the 33rd Hawaii International Conference on System Sciences*. Jan 4-7, 2000, Maui, Hawaii. Washington, DC: IEEE Computer Society.

APPENDIX 1: UNIVERSITY OF FORT HARE – RESEARCH ETHICAL CLEARANCE CERTIFICATE

University of Fort Hare
Together in Excellence

ETHICAL CLEARANCE CERTIFICATE
REC-270710-028-RA Level 01

Certificate Reference Number: OND101SMAT01

Project title: Information needs and information-seeking behavior of practicing medical doctors at Katutura and Windhoek Central state hospitals in Namibia.

Nature of Project: PhD

Principal Researcher: David Matsveru

Supervisor: Prof EM Ondari-Okemwa
Co-supervisor:

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

Special conditions: Research that includes children as per the official regulations of the act must take the following into account:
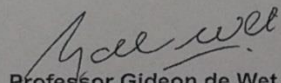
Note: The UREC is aware of the provisions of s71 of the National Health Act 61 of 2003 and that matters pertaining to obtaining the Minister's consent are under discussion and remain unresolved. Nonetheless, as was decided at a meeting between the National Health Research Ethics Committee and stakeholders on 6 June 2013, university ethics committees may continue to grant ethical clearance for research involving children without the Minister's consent, provided that the prescripts of the previous rules have been met. This certificate is granted in terms of this agreement.

The UREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
  - Any unethical principal or practices are revealed or suspected
  - Relevant information has been withheld or misrepresented
  - Regulatory changes of whatsoever nature so require
  - The conditions contained in the Certificate have not been adhered to

- Request access to any information or data at any time during the course or after completion of the project.

- In addition to the need to comply with the highest level of ethical conduct principle investigators must report back annually as an evaluation and monitoring mechanism on the progress being made by the research. Such a report must be sent to the Dean of Research's office
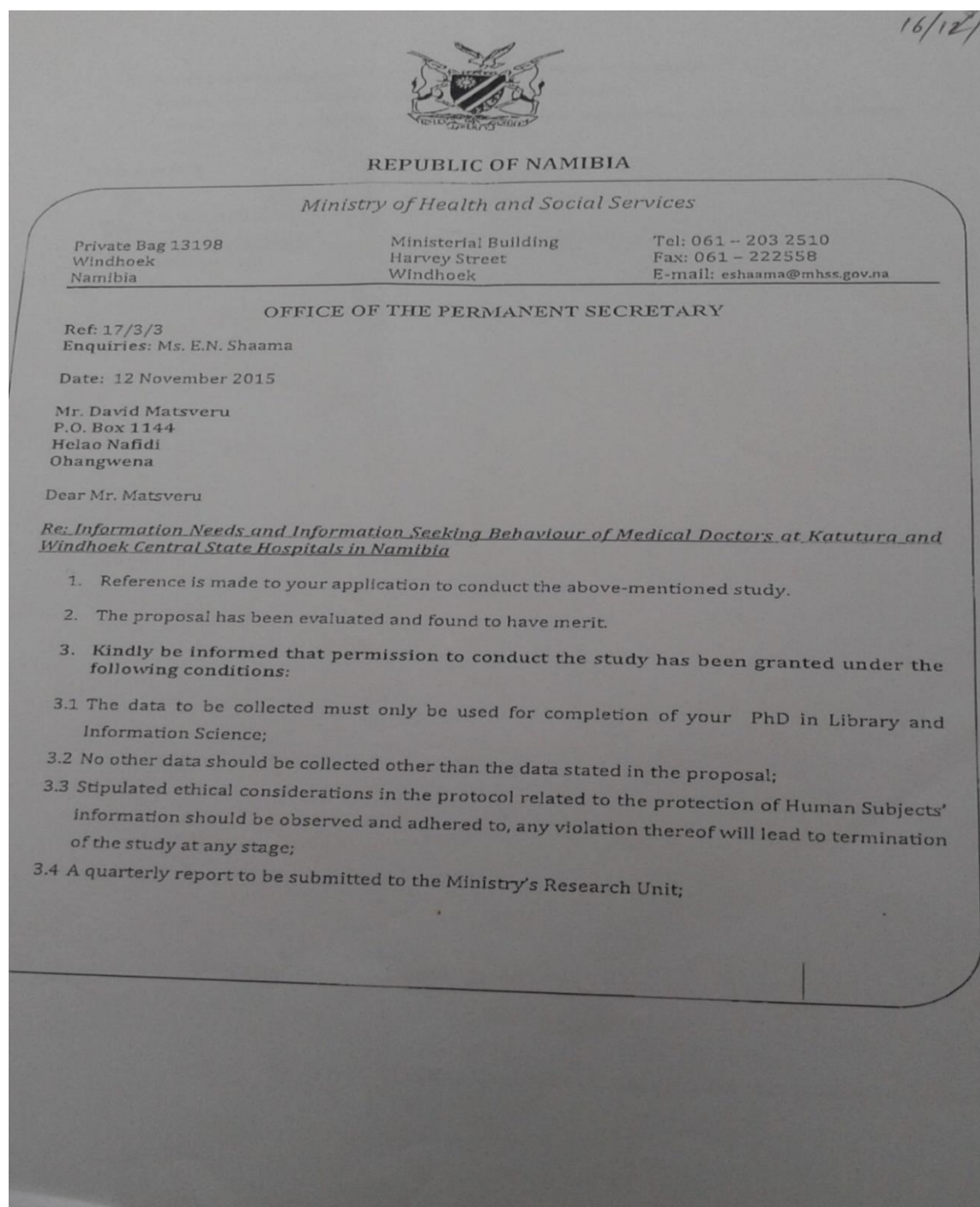
The Ethics Committee wished you well in your research.

Yours sincerely
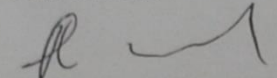
Professor Gideon de Wet
Dean of Research

27 November 2015

APPENDIX 2: LETTER FROM MINISTRY OF HEALTH AND SOCIAL SERVICES

16/12/

REPUBLIC OF NAMIBIA

Ministry of Health and Social Services

Private Bag 13198	Ministerial Building	Tel: 061 – 203 2510
Windhoek	Harvey Street	Fax: 061 – 222558
Namibia	Windhoek	E-mail: eshaama@mhss.gov.na

OFFICE OF THE PERMANENT SECRETARY

Ref: 17/3/3
Enquiries: Ms. E.N. Shaama

Date: 12 November 2015

Mr. David Matsveru
P.O. Box 1144
Helao Nafidi
Ohangwena

Dear Mr. Matsveru

Re: Information Needs and Information Seeking Behaviour of Medical Doctors at Katutura and Windhoek Central State Hospitals in Namibia

1. Reference is made to your application to conduct the above-mentioned study.

2. The proposal has been evaluated and found to have merit.

3. Kindly be informed that permission to conduct the study has been granted under the following conditions:

3.1 The data to be collected must only be used for completion of your PhD in Library and Information Science;

3.2 No other data should be collected other than the data stated in the proposal;

3.3 Stipulated ethical considerations in the protocol related to the protection of Human Subjects' information should be observed and adhered to, any violation thereof will lead to termination of the study at any stage;

3.4 A quarterly report to be submitted to the Ministry's Research Unit;

3.5 Preliminary findings to be submitted upon completion of the study;

3.6 Final report to be submitted upon completion of the study;

3.7 Separate permission should be sought from the Ministry for the publication of the findings.

Yours sincerely,

Andreas Mwoombola (Dr)
Permanent Secretary

2015 -11- 13
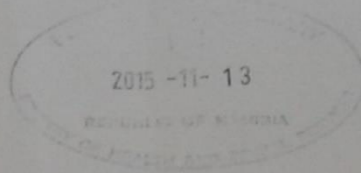
"Health for All"

APPENDIX 3: LETTER FROM SUPERINTENDENT – KATUTURA HOSPITAL

Republic of Namibia

Ministry of Health and Social Services

Private Bag 13215 **WINDHOEK** Namibia	Intermediate Hospital Katutura Independence Avenue **WINDHOEK**	Telephone (061) 203 4004/5 Telefax (061) 222706

Enquiries: Ms. P. Swartbooi

Date: 16 December 2015

OFFICE OF THE MEDICAL SUPERINTENTED

Mr. David Matsveru
P O Box 1144
Helao Nafidi
Ohangwena

RE: **INFORMATION NEEDS INFORMATION SEEKING BEHAVIOUR OF MEDICAL DOCTORS AT KATUTURA AND WINDHOEK CENTRAL STATE HOSPITALS IN NAMBIA**
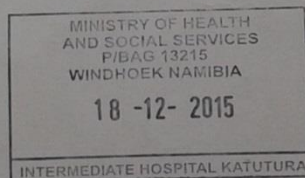
The above mentioned subject refers:

This office hereby grants you permission to do research on information needs and information seeking behaviour of Medical Doctors at Katutura and Windhoek Central State Hospitals in Namibia.

Thank you

Yours in health

DR. F. M. SHIWEDA
CHIEF MEDICAL OFFICER

> MINISTRY OF HEALTH
> AND SOCIAL SERVICES
> P/BAG 13215
> WINDHOEK NAMIBIA
> 18 -12- 2015
> INTERMEDIATE HOSPITAL KATUTURA

APPENDIX 4: LETTER FROM WINDHOEK CENTRAL HOSPITAL SUPERINTENDENT

REPUBLIC OF NAMIBIA

Ministry of Health and Social Services

Private Bag 13215		Tel. No: (061) 203 3004
Windhoek	Harvey Street	Fax No: (061) 222886
Namibia	Windhoek Central Hospital	
Enquiries: Dr. F. Zam	Ref. No.	Date : 13 January 2016

OFFICE OF THE MEDICAL SUPERINTENDENT

WINDHOEK CENTRAL HOSPITAL

To : **Senior Medical Officers : All Departments**
Windhoek Central Hospital
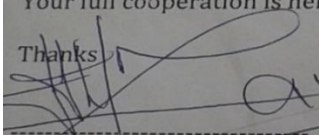**Katutura Intermediate Hospital**

Dear Colleagues

REF: SEEKING YOUR ASSISTANCE IN CONDUCTING A RESEARCH.

The holder of this letter Miss Lorna Neuman is a Research Assistant whose protocol of research has been blessed by the Ministry of Health's Research Committee, and has been allowed to conduct her study amongst the doctors working in the two referral state hospitals in Windhoek.

Kindly please assist her by facilitating her contacts with the doctors in your respective departments for her to conduct her study smoothly.

Your full cooperation is hereby kindly requested.

Thanks

Dr. S. Shalongo
Medical Superintendent

cc. **Dr. N. Amagulu**
Medical Superintendent
Katutura Intermediate Hospital

Cell Lorna 0813237166 *"Health for All"*

335

APPENDIX 5: INFORMED CONSENT LETTER AND FORM

I David Matsveru, a student in Library and Information Science at Fort Hare

University (South Africa), am conducting a research on 'Information needs and information seeking behaviour of practising medical doctors at Katutura and Windhoek Central state hospitals in Namibia'. The study aims to explore and investigate the information needs and information seeking behaviour of practising medical doctors for their clinical decision-making, and the results of this study will be used to suggest improvements to the quality of health information services at Katutura and Windhoek Central state hospitals in Namibia.

Please understand that you are not being forced to take part in this study and the choice whether to participate or not is yours alone. However, I would really appreciate if you can share your thoughts with me. If you choose not take part in answering these questions, you will not be affected in any way. If you agree to participate, you may stop me at any time and tell me that you don't want to go on with the interview. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way. Confidentiality will be observed professionally.

I will not be recording your name anywhere on the questionnaire and no one will be able to link you to the answers you give. Only the researchers will have access to the unlinked information. The information will remain confidential and there will be no 'come-backs' from the answers you give.

The questionnaire might take you 10 to 15 minutes while the interview will last for 30 minutes according to a pilot study that was carried out at Engela hospital with five (5) medical doctors. I will be asking you questions and I therefore request that you be as open and honest as possible in answering these questions. Some questions may be personal and sensitive in nature. I will be asking some questions that you may not have thought about before, and which also involve thinking about the past or the future. I know that you cannot be absolutely certain about the answers to these questions but I ask that you try to think about these questions. When it comes to answering questions there are no right and wrong answers. If possible, I would like to come back to you once I have completed the study to inform you about the results and discuss my findings and proposals with regards to improving information provision to medical doctors at Katutura and Windhoek Central state hospitals.

_____

INFORMED CONSENT

I hereby agree to participate in research regarding the 'Information needs and Information–seeking Behaviour of Practising Medical Doctors at Katutura and Windhoek Central State Hospitals in Namibia'.

I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop this interview at any point should I not want to continue and that this decision will not in any way affect me negatively. I understand that this is a research project whose purpose is not necessarily to benefit me personally. I have received the telephone number of a person to contact should I need to speak about any issues which may arise in this interview. I understand that this consent form will not be linked to the questionnaire, and that my answers will remain confidential. I understand that if at all possible, feedback will be given to my community on the results of the completed research.

……………………………..

Signature of participant   **Date**:…………………..

I hereby agree to the tape recording of my participation in the study

……………………………..

Signature of participant   **Date**:…………………..

APPENDIX 6: QUESTIONNAIRE

INFORMATION NEEDS AND INFORMATION-SEEKING BEHAVIOUR OF PRACTISING MEDICAL DOCTORS AT KATUTURA AND WINDHOEK CENTRAL STATE HOSPITALS IN NAMIBIA

SECTION A: DEMOGRAPHIC INFORMATION (*Please tick the box with the appropriate answer*)

1.	Gender ☐ male ☐ female	6.	Highest education ☐ Bachelor's ☐ Master's ☐ PhD ☐ Other (please specify)………
2.	Age group ☐ Below 30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ Over 61	7.	Job title ☐ Consultant ☐ Specialist ☐ Senior specialist ☐ Registrar ☐ Assistant registrar ☐ Senior registrar ☐ Trainee ☐ Other (please specify)………..
3.	Nationality ☐ Namibian ☐ Non Namibian		
4.	Work place ☐ Katutura Hospital ☐ Windhoek Central Hospital	8.	Work Experience as a medical doctor ☐ Less than 1 year ☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ 16-20 years ☐ More than 20 years
5.	Department ☐ General Surgery ☐ Internal Medicine ☐ Orthopaedics ☐ Obstetrics & Gynaecology ☐ Urology ☐ Paediatrics ☐ Emergency/ Casualty Unit ☐ Other (please specify)……..	9.	Working experience at Katutura / Windhoek Central ☐ Less than 1 year ☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ 16-20 years ☐ More than 20 years

SECTION B: INFORMATION NEEDS

Which of the following information needs apply to you in relation to your work as a medical practitioner? *(Tick all that apply to you)*

- ☐ Improving your clinical decision-making
- ☐ Keeping up-to-date
- ☐ Improving your knowledge
- ☐ Continuing education
- ☐ Sharing knowledge with your colleagues
- ☐ Answering colleague's questions
- ☐ Answering patient's questions
- ☐ Writing reports / research paper (not for publication)
- ☐ Writing reports / research paper (for publication)
- ☐ Teaching staff / students / colleagues (case presentations)
- ☐ Other (please specify)…………………………………..

SECTION C: INFORMATION SEEKING BEHAVIOUR

1. What type of information resources do you use in your hospital when you need information? *(Please tick all that apply to you)*
   - ☐ Hospital library
   - ☐ Departmental collection (journals, books, tapes etc.)
   - ☐ Office telephone
   - ☐ Mobile telephone provided (i.e. not personal)
   - ☐ Internet
   - ☐ Online database (e.g. Medline)
   - ☐ Annual reports
   - ☐ Personal collection (e.g. books, journals etc.)
   - ☐ Statistics (from statistical department)
   - ☐ Other (specify)…………………………………………

2. What meetings do you attend for medical practice*? (Please tick all that apply to you)*
   - ☐ Ward rounds
   - ☐ Daily meetings in your hospital
   - ☐ Journal clubs
   - ☐ Meetings in other hospitals
   - ☐ Attending conferences
   - ☐ Courses in other organisations (e.g. computer training)
   - ☐ Seminars in your hospital
   - ☐ Seminars in other hospitals
   - ☐ Workshops in other organisations (e.g. computer training)
   - ☐ Other (please specify)…………………………

3. Please circle the degree to which you use the following resources when you see a patient in the Wards, Outpatient and Casualty areas for clinical decision-making?

(If you work in one department just answer the section that relates to you)

1 = Never   2 = Sometimes   3 = frequently

Resources	Outpatient				Wards			Casualty		
Ask patient	0	1	2	3	1	2	3	1	2	3
Ask patient's relatives	0	1	2	3	1	2	3	1	2	3
Ask colleagues	0	1	2	3	1	2	3	1	2	3
Ask nurses	0	1	2	3	1	2	3	1	2	3
Ask pharmacist	0	1	2	3	1	2	3	1	2	3
Ask ambulance staff	0	1	2	3	1	2	3	1	2	3
Patient file / medical record	0	1	2	3	1	2	3	1	2	3
Order tests/ investigations	0	1	2	3	1	2	3	1	2	3
Departmental collection	0	1	2	3	1	2	3	1	2	3
Drug literature	0	1	2	3	1	2	3	1	2	3
Hospital computer system	0	1	2	3	1	2	3	1	2	3
Internet	0	1	2	3	1	2	3	1	2	3
Personal collection	0	1	2	3	1	2	3	1	2	3
Medical library	0	1	2	3	1	2	3	1	2	3
Call other hospitals	0	1	2	3	1	2	3	1	2	3
Other (specify)…………..										

SECTION D: INFORMATION RESOURCES USED BY MEDICAL DOCTORS

1. Which library do you visit most? (Please tick one)
    - ☐ Medical library
    - ☐ Other (Please specify) …………………….………………

2. How often do you visit this library (Please tick one)
    - ☐ Daily
    - ☐ Once a week
    - ☐ Once a month
    - ☐ Other (Please specify) …………………………………

3. What type of information resources do you seek in a library? *(Please tick all that apply)*
    - ☐ Books
    - ☐ Serials
    - ☐ Internet
    - ☐ Medical database
    - ☐ Thesis / research paper
    - ☐ Government publications
    - ☐ Annual reports
    - ☐ Video tapes / Microfilms
    - ☐ Conference papers
    - ☐ Statistical reports
    - ☐ Others (Please specify) ……………………………………

4. Where do you use the Internet? *(Please tick all that apply)*
   - ☐ Hospital
   - ☐ Home
   - ☐ Hospital library
   - ☐ Internet café
   - ☐ Other libraries
   - ☐ Other (specify) …………………………………………………………

5. How often do you refer to the following information sources?
(Please circle the frequency with which you use the library and Internet for the following reasons).

1 = Never   2 = Sometimes   3 = frequently

Reasons	Library				Internet			
Personal use	0	1	2	3	0	1	2	3
Improve your clinical decision-making	0	1	2	3	0	1	2	3
Knowledge improving	0	1	2	3	0	1	2	3
Keep up-to-date	0	1	2	3	0	1	2	3
Continuing education	0	1	2	3	0	1	2	3
Answer colleagues' questions	0	1	2	3	0	1	2	3
Answer patients' questions	0	1	2	3	0	1	2	3
Research / reports / articles	0	1	2	3	0	1	2	3
Teaching staff / students	0	1	2	3	0	1	2	3
Other (Please specify)………………								

SECTION E: FACTORS AFFECTING MEDICAL DOCTORS' INFORMATION SEEKING BEHAVIOUR

1. Which of the following have been problems for you in obtaining the information you need? (Please tick all that apply)
   - ☐ Library not available in your hospital
   - ☐ Library is available but located very far from your department
   - ☐ Inadequate resources in the library
   - ☐ Lack of information technology such as mobile, email to communicate with your colleagues
   - ☐ Language problem in communicating with patients/ patients' relatives
   - ☐ Lack of patient awareness in understanding medical terms
   - ☐ Gathering patients' information from relatives
   - ☐ Lack of time to talk with patients
   - ☐ Missing patient's file
   - ☐ Inaccessibility of the patient file
   - ☐ Unorganised forms in the patient files
   - ☐ Missing form and incomplete information in the patient's file
   - ☐ Lack of help from Medical Records staff
   - ☐ Too much information on the Internet

- ☐ High cost of subscription of electronic journals
- ☐ Lack of searching skills
- ☐ No facility to communicate with other hospitals
- ☐ Other (Please specify) …………………………………………….

SECTION F: IMPROVING INFORMATION RESOURCES & SERVICES

1. Please indicate your degree of satisfaction in using the following information resources, services and other activities for gathering information.

Information resources/ services /activities	Dissatisfied	Neutral	Satisfied
Services provided by hospital library			
Services provided by Medical Records department			
Communication with other departments			
Accessibility of the Internet			
Communication with your colleagues			
Communication with your patients			
Communication with other hospitals and health centres			
Daily / weekly / monthly meeting and seminars			
Hospital information system			
Attending conferences			
Other (Please specify)……………………..			

2. What do you think is the best way to develop and improve health information resources and services at Katutura and Windhoek Central state hospitals? (Please tick all that apply)
   - ☐ Health education for patients
   - ☐ Provide hospital library
   - ☐ Provide better-qualified staff in the Medical Records (MR) Department
   - ☐ Provide better-qualified staff in the hospital library
   - ☐ Train doctors on the use of the Internet and Information Technology
   - ☐ Improve communication with other hospitals and health centres
   - ☐ Improve communication with international hospitals and healthcare centres
   - ☐ Other (specify) ………………………………………………………….

Would you like me to send you a summary of the research results?
   - ☐ Yes
   - ☐ No

If so please state your e-mail address: …………………………………………….

I may wish to do some follow-up interviews. If you are willing to be interviewed telephonically would you please provide me your nickname, telephone or cell number.

…………………………………………………………………………………………..

THANK YOU!

APPENDIX 7: INTERVIEW GUIDE

INFORMATION NEEDS AND INFORMATION-SEEKING BEHAVIOUR OF PRACTISING MEDICAL DOCTORS AT KATUTURA AND WINDHOEK CENTRAL STATE HOSPITALS IN NAMIBIA

Introduction (5 min)

Welcome and icebreaker

Review the questionnaire

Topics of discussion

1. Doctor's information needs for medical practice

2. Use of information sources (personal library, Internet, library and interpersonal communication

3. Problems in obtaining information for medical practice

4. Suggestions in improving information provision at Katutura and Windhoek Central state hospitals

Prompts for general discussion (30 minutes)

1. Many doctors need information for keeping up-to-date, please tell me how keeping up-to-date with information is an important need for your medical practice?

2. Do you have any other needs?

3. Tell me about the type of resources in your personal collection?

4. How do you keep the collection updated?

5. Where do you keep it updated?

6. How is it important to you?

7. How frequently do you use the Internet?

8. What websites do you search for health information?

9. What are your criteria for choosing the websites?

10. Tell me about your experience of using the Health Care Information System?

11. How useful do you feel it is to have a mobile telephone provided by the hospital?

12. Could you explain why you rarely visit the library?

13. What is the value for using library?

14. Do you think you need a library in your hospital? Why?

15. Do you need help when you search for information in the library? If yes? How?

16. Could you explain why sometimes doctors ask pharmacists for information?

17. What is the value of asking pharmacists for information?

18. Could you explain the reason for attending daily, weekly and monthly meetings?

19. What do you discuss in these meetings?

20. What are your suggestions to improve the health education in Namibia?

21. Have you ever worked with other health care organizations outside Namibia?

22. Could you explain your experiences with the information systems there?

23. Do you have other problems in obtaining the health information you need that you would like to mention?

24. Would you like to provide any suggestions for improving the current health information provision in Namibia?

Conclusion (5 min)

Are there any other issues related to information provision services and resources you would like to add?

APPENDIX 8: LANGUAGE EDITING CERTIFICATE

CERTIFICATE OF EDITING

To whom it may concern

This is to certify that I have edited the thesis detailed below for English language (British English), spelling, grammar, punctuation, layout, and referencing.

Thesis Title:

INFORMATION NEEDS AND INFORMATION-SEEKING BEHAVIOUR OF PRACTISING MEDICAL DOCTORS AT KATUTURA AND WINDHOEK CENTRAL STATE HOSPITALS IN NAMIBIA

Thesis Author:

David Matsveru

University:

University of Fort Hare

I am a freelance editor and I have edited several hundreds of academic and non-academic documents.

Signed: _____   Date: _____ 2 June 2019 _____
Florence Matsveru, PhD