HEALTH INFORMATION SEEKING BEHAVIOUR AND UTILISATION FOR THE MANAGEMENT OF DIABETES MELLITUS AMONG PATIENTS IN TERTIARY HEALTHCARE FACILITIES IN NORTH CENTRAL NIGERIA

BY

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ABSTRACT

This study examined the health information-seeking behaviour and utilisation for the management of diabetes mellitus among patients in tertiary healthcare facilities in North-central Nigeria. The objectives of the study were to determine the sources of health information used, the information needs of diabetic patients, the health information-seeking behaviour, the frequency of use of health information, the health information literacy skill, the level of satisfaction derived from using health information, the effect of health information seeking behaviour on mental health, the impact of health information seeking behaviour on diabetes management, the socio-economic determinants of health information seeking behaviour, and the challenges encountered in using health information. The study adopted a descriptive survey research design. The study population was 406 diabetic patients drawn from seven (7) tertiary healthcare facilities in North-central Nigeria, of which the entire population was used. Data were collected using a self-designed questionnaire. A total of 406 copies of the questionnaire were administered, of which 331 copies were retrieved and found usable, giving a response rate of 82%. Data collected were presented and analysed using descriptive and inferential statistics. The study revealed that diabetic patients sought information from booklets, brochures, and leaflets from clinics (= 2.65), the Internet (= 2.91), WhatsApp (= 2.94), Facebook groups (= 2.71), healthcare professionals (= 2.72)and other diabetic patients (= 3.10). The health information literacy skills of the respondents were: Computer and Internet navigation (= 2.58), sharing health information across various platforms (= 2.50), identifying health information sources (= 2.63), recognising health information needs (= 2.71) and how to use health information to make a good decision (= 2.73). The result revealed further that the health information seeking behaviour of diabetic patients in tertiary healthcare facilities in North-central Nigeria has a significant influence on the management of diabetes mellitus (F (1,330) = 52.823; R = 0.357,R square = 0.127 and Adjusted R square = 0.126, P<0.05). In addition, health information utilisation of diabetic patients in tertiary healthcare facilities in North-central Nigeria has a significant influence on the management of diabetes mellitus with F (1,330) = 65.256 , R =0.595, R square = 0.354, Adjusted R square = 0.353, P<0.05). Moreover, the study revealedthat there is a significant influence of health information seeking behaviour and health information utilisation on the management of diabetes mellitus by diabetic patients in tertiaryhealthcare facilities in North-central, Nigeria, F (2,329) = 36.015, R = 0.638, R square = 0.407, Adjusted R square = 0.406 and P<0.05). Some of the recommendations proffered werethat the management of the tertiary healthcare facility and the institution's library should continue to provide informative booklets and brochures in the facilities and libraries and develop a user-friendly website or portal dedicated to diabetes information. Health information providers should incentivise the active use of health information by diabetic patients. This initiative will encourage the use of health information, which would positivelyimpact the management of their health. Finally, the World Health Organisation and International Diabetic Federation should sponsor the publishing of diabetic information on booklets, brochures, leaflets, magazines, newspapers, WhatsApp groups, Instagram, blogs, Twitter, and broadcast media.

TABLE OF CONTENT

LIST OF TABLES

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

It is generally said that “health is wealth,” so whenever an individual's health is challenged, it reduces the productivity of such a person. Health is an inevitable mechanism that determines the effective functioning of human beings in society. Societal well-being and development depend largely on how citizens acquire good health. Since its inception, the United Nations (UN) has actively promoted and protected good health worldwide. Leading that effort within the UN system is the World Health Organization (WHO), whose constitution came into force on 7 April 1948, a date now celebrated every year as World Health Day. Good health in the community can reflect mental and social well-being and the absence of disease (WHO, 2022). The importance of good health in society is also reflected in the Sustainable Development Goal agenda for 2030. The third Sustainable Development Goal agenda states, "Ensure healthylives and promote well-being for all ages” (United Nations, 2016).

In 1948, the World Health Organisation was responsible for the International Classification of Diseases, which has become the International Standard for defining and reporting diseases and health conditions. Some of them are: Polio, Smallpox, Tuberculosis, AIDs, Malaria, Cancer, Ebola, and Diabetes. Diabetes is a chronic metabolic disease characterised by elevated blood glucose (or blood sugar) levels, leading to serious damage to the heart, blood vessels, eyes, kidneys, and nerves over time. There are various categories of diabetes. Type 1 diabetes (previously known as insulin-dependent, juvenile or childhood-onset diabetes) is characterised by deficient insulin production in the body. People with type 1 diabetes require daily insulin

administration to regulate the amount of glucose in their blood. If they do not have access to insulin, they cannot survive. The cause of type 1 diabetes is not known, and it is currently not preventable. Symptoms include excessive urination, thirst, constant hunger, weight loss, vision challenges, and fatigue. Type 2 diabetes (formerly called non-insulin-dependent or adult-onset diabetes) results from the body's ineffective use of insulin. Type 2 diabetes accounts for the vast majority of people with diabetes around the world. Symptoms may be similar to those of type 1 diabetes but are often less marked or absent. As a result, the disease may go undiagnosed for several years until complications have already arisen. For many years, type 2 diabetes was seen only in adults, but it has begun to occur in children (WHO, 2022). Impaired Glucose Tolerance (IGT) and Impaired Fasting Glycaemia (IFG) are intermediate conditions in the transition between normal blood glucose levels and diabetes (especially type 2), though the transition is not inevitable. People with IGT or IFG are at increased risk of heart attacks and strokes (WHO, 2022).

Gestational Diabetes Mellitus (GDM) is a temporary condition that occurs in pregnancy and carries a long-term risk of type 2 diabetes. The condition is present when blood glucose values are above normal but still below those diagnostic of diabetes. Women with gestational diabetes are at increased risk of some complications during pregnancy and delivery, as are their infants. Gestational diabetes is diagnosed through prenatal screening rather than reported symptoms (WHO, 2022).

Alasiri and Bafaraj (2016) described Diabetes mellitus (DM) as affecting nearly all body organs. The principal risk factor for the development and progression of DM complications is the duration of diabetes. Consequently, the complications of diabetes associated with a longer

duration of the disease will become a major challenge facing the healthcare sector. Diabetes Mellitus (DM) was previously considered to be rare in sub-Saharan Africa. However, its prevalence is increasing mainly because of urbanisation and lifestyle changes (Sabir *et al.,* 2019).

People who have diabetes are faced with a variety of acute and chronic complications that could result in great financial and psychological pressure on the patients and their families (Kalra *et al.,* 2018). Diabetes mellitus (DM) is a chronic disorder that is not only assuming pandemic proportions worldwide but also poised to affect the developing countries of the world much more than their developed counterparts. The world prevalence is estimated to increase from 537 million people as of 2022 to 783 million by 2045, and in Africa, the numberof people with diabetes as of 2022 was 24 million. This figure is projected to rise by 129% to 55 million in 2045, predominantly populated in some of the region's most populous countries: South Africa, the Democratic Republic of Congo, Nigeria, and Ethiopia (International Diabetes Federation, 2022). In 2015, diabetes was one of the leading causes of non- communicable disease (NCD) death, contributing to 1.5 million deaths globally and 321,100 deaths in the African region, and there were 1,702,900 cases of diabetes in Nigeria in 2015 (Mutyambizi *et al.*, 2018).

One of the most important parts of diabetes treatment, according to Keyvanara *et al.* (2013) is self-management. Self-management increases the conscious control over the disease, and its active management can lower the secondary costs caused by diabetes. It is important to note that the role of information in disease prevention (reduction of stress, anxiety, and uncertainty,

gaining control over the diseases, and improving self-management) greatly affects the self-management abilities of diabetic patients when access to necessary information is promptly.

Information is power, and information brings about change and; therefore, information is a non-negotiable precondition for effecting any desired change. However, if information is not used, all efforts in gathering and organising it are wasted. Use of information is another variable that can enhance how diabetic patients manage diabetes mellitus. Use is a concept thatexamines how objects are exploited to produce the maximum value they were designed for. Oyedum (2015) described use as a concept that has to do with value or appreciation, and where an item or object has no value, it cannot be put to use. According to Mingers and Willcocks (2014), the utilisation of any information leads to some form of action or result which could be a reply, an activity, or just a decision not to respond.

Providing health information on patient's health problems and self-care at the right time may help encourage individuals to manage diseases and gain more optimum health. According to Anyaoku and Nwosu (2017), there are two key types of health information, both of which people need. First is general health information available to all; this type of health information provides information about lifestyle options, care providers, diagnoses, conditions, self-care and treatment options (including risks), and standards of care. This type of health information helps individuals to control their chances of contracting diseases. The second is personalised health information, specifically on an individual's condition, care options, and possible outcomes. This helps people to control and manage their condition after contact with a certain disease.

Therefore, health information-seeking behaviour refers to individuals' actions to obtain health-related information. With the increasing availability of health information on the Internet, the behaviour has shifted from seeking information from healthcare providers to searching for information online. Research has shown that health information-seeking behaviour has significant implications for individual health outcomes, including health behaviours and healthcare utilisation. For instance, more proactive individuals seeking health information are more likely to engage in preventive health behaviours and seek healthcare services when needed (Lu, 2020). On the other hand, those who lack health literacy and access to health information may face challenges in making informed decisions about their health (Chen *et al.,* 2018).

Van der Vaart (2019) revealed that individual characteristics, such as age, gender, education level, and health status, influence health information-seeking behaviour. For example, younger individuals are more likely to seek health information online, while older individuals prefer to obtain information from healthcare providers. Additionally, individuals with higher education levels tend to use more complex sources of health information, such as scientific journals and research articles. In comparison, those with lower education levels rely on simpler sources such as brochures and pamphlets (Chen *et al.*, 2018). Moreover, individuals with chronic illnesses are more likely to seek health information to manage their conditions and make informed decisions about their health (Lu, 2020).

Furthermore, people who are well informed and conscious of using the information at their disposal will make the right change and not suffer any avoidable predicament. Information is the main part of people's lives in information societies. The community and people cannot

advance toward their goals and daily lives without the necessary information. One of the information needs of people in everyday life is health information. Health information includes a wide range of information, such as, information about sicknesses, how to prevent them and their initial treatment, which is one of the main concerns for many people (Dastani *etal.*, 2019).

Supporting society's access to health information causes a change in the philosophy of health care that leads to the national development of health (Adeyoyin and Oyewusi, 2015). Health customers face several challenges when seeking health information, such as the health system's complexity, the increased incidence of chronic sicknesses, the need for participationin care, and the increased information available. Individuals should be able to accept new roles in information seeking, protection for rights and privacy issues, understanding responsibilities, assessing and monitoring health, making decisions about insurance, and choosing their care. Health literacy is the individual capacity to acquire, interpret, and understand basic information and health services appropriate for decision-making. Finding health information isa method that many people use as a means of coping and reducing stress. Increasing the incidence of certain diseases, inadequate knowledge, and limited time that healthcare professionals spend on the patient are among the factors that stimulate patients to seek health information apart from the healthcare system (Okhovati *et al.*, 2016).

The researcher has observed from statistics that a good number of people have died; others are very sick and almost at the point of giving up the ghost in Nigeria due to the pandemic called diabetes. Since diabetes is a sickness that somebody could manage and possibly cure if health information is properly utilised, the study intends to investigate the health information-seeking

behaviour and utilisation for managing diabetes mellitus among patients in North Central, Nigeria.

1.2 Statement of the Research Problem

Information is the basic ingredient for the survival and development of the entire universe. Health information resources play an essential role in the health status of people living with diabetes as it helps them manage the complications that accompany the disease and prolong their life. Studies have shown that despite all efforts by the United Nations, the World Health Organisation, and other collaborating bodies to reduce morbidity and mortality as well as increasing prevalence of diabetes yielded little or no result. WHO (2021) statistics revealed that 422 million people worldwide have diabetes, particularly in low and middle-income countries like Nigeria; diabetes is one of the leading causes of death in the world and causes 1.5 million deaths yearly. According to the International Diabetes Federation (2021) report, 11.2 million people are currently living with diabetes mellitus in Nigeria; it is estimated to exceed 18.79 million in 2045. Worse still, the economic and financial impact of diabetes on related expenditure per person in Nigeria has been rising steadily over the years. Diabetes treatment rose from N60,000 in 2011 to N300,000.00 in 2021, and the direct cost of treating diabetic foot ulcers has increased to over N2 million.

Amid the menace, one wonders if there is health information or it could be that probably the diabetic patients do not have the right information-seeking behaviour, or possibly they do not make use of the available health information; perhaps the usage of this health information has no impact on the management of diabetes? Against this backdrop, the researcher embarked on studying the health information-seeking behaviour and utilisation for managing diabetes mellitus among diabetic patients in tertiary healthcare facilities in North Central, Nigeria.

1.3 Aim and Objectives of the Study

The study aimed to examine the health information-seeking behaviour and utilisation for the management of diabetes mellitus among patients in tertiary healthcare facilities in North Central Nigeria. The specific objectives of the study are to:

1. determine the sources of health information used by diabetic patients in tertiary healthcare facilities in North Central, Nigeria;
2. determine the information needs of diabetic patients in tertiary healthcare facilities in North Central Nigeria;
3. ascertain the health information seeking behaviour for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria;
4. determine the frequency of use of health information for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria;
5. determine the health information literacy skill for the management of diabetes mellitus by diabetic patients in tertiary health facilities in North Central, Nigeria;
6. determine the level of satisfaction derived from the use of health information by diabetic patients in tertiary healthcare facilities in North Central, Nigeria;
7. determine the effect of health information seeking behaviour on the mental health of diabetic patients in tertiary healthcare facilities in North Central, Nigeria;
8. determine the impact of health information utilisation on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria;
9. identify the socio-economic determinants of health information utilisation among patients in tertiary healthcare facilities in North Central, Nigeria;

10. determine the challenges encountered in using health information by diabetic patients in tertiary healthcare facilities in North Central, Nigeria;
11. ascertain the significant influence of health information-seeking behaviour on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria;
12. determine the significant influence of health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria
13. determine the significant influence of health information-seeking behaviour and health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria and
14. determine the significant influence of frequency of use, health information literacy, and socio-economic determinants on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

1.4 Research Questions

The following research questions were formulated to guide the study:

1. What are the sources of health information used by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?
2. What is the information needs of diabetic patients in tertiary healthcare facilities in North Central Nigeria?
3. What is the health information-seeking behaviour for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?
4. What is the frequency of use of health information for the management of diabetes

mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

5. What is the health information literacy skill for the management of diabetes mellitus by diabetic patients in tertiary health facilities in North Central, Nigeria?
6. What is the level of satisfaction derived from the use of health information by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?
7. What is the effect of health information-seeking behaviour on the mental health of diabetic patients in tertiary healthcare facilities in North Central, Nigeria?
8. What is the impact of health information utilisation on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?
9. What are the socioeconomic determinants of health information utilisation behaviour among patients in tertiary healthcare facilities in North Central, Nigeria?
10. What are the challenges encountered by diabetic patients in using health information in tertiary healthcare facilities in North Central, Nigeria?

1.5 Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

H_{o1}. There is no significant influence of health information-seeking behaviour on the management of diabetes mellitus in tertiary healthcare facilities in North Central,Nigeria

H_{o2}. There is no significant influence of health information utilisation on the managementof diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

H_{o3}. There is no significant influence of health information-seeking behaviour and health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

H_{o4}. There is no significant influence of frequency of use, health information literacy and socioeconomic determinants on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

1.6 Scope of the Study

The general scope of the study was to examine the health information seeking behaviour and utilisation for managing diabetes mellitus among patients. The population scope of the study covered tertiary healthcare facilities in North Central Nigeria.

1.7 Significance of the Study

The study's findings on health information-seeking behaviour and utilisation for managing diabetes mellitus among patients in tertiary healthcare facilities in North Central Nigeria Would be beneficial to United Nations Sustainable Development Goals, International Diabetic Foundation (IDF), medical library management and librarians, the ministry of health, health professionals, diabetic patients, and researchers.

The study's findings will be of immense significance to the United Nations as they will help complement their efforts towards achieving the third sustainable development goal, ensuring healthy lives and promoting well-being for all ages before the year 2030. It would assist the International Diabatic Foundation with empirical data of diabetic patients in North Central Nigeria and portray the best channels health information utilisation can reduce the wide spread of diabetes.

The findings of this study will also assist health workers in how best to treat diabetic patients, especially during health talks in MOPD (Medical Outpatient Departments). The study findings

will help librarians, medical library management, and information specialists determine the best ways to package health information for their patrons. Moreover, the study will greatly interest the Federal Ministry of Health as it will complement the ministry's effort in controllingand preventing diabetes mellitus.

This study will contribute to the existing knowledge on health information-seeking behaviour and utilisation for diabetes management. Exploring this specific aspect within tertiary healthcare facilities can expand the understanding of the factors influencing patients' behaviour and decision-making. The research outcomes can be a reference for future studies, promoting further research and understanding in this field.

1.8 Operational Definition of Terms

The following terms are defined as used in the study

Diabetic Patients: are people living with diabetic mellitus of various categories ranging from type 1 diabetes, type 2 diabetes, gestational diabetes, and foot ulcer diabetes in the studied area.

Health Information: sources are the various information resources that contain medical information needed by diabetic patients that can help in self-management

Health literacy: this refers to the ability of diabetic patients to access, process, and ustilise health information that will improve their health status.

Information Need: refers to the desire to locate and use health information for the management of diabetes mellitus

Information Seeking Behaviour: the act of interacting with systems in order to get specific answers.

Tertiary Healthcare Facilities: are the healthcare centres where diabetic patients receive treatment or diagnoses unavailable at primary or secondary care, such as Federal Medical Centre, Bida, Federal Medical Centre, Makurdi, Federal Medical Centre Keffi, Federal Medical Centre, Lokoja, Jos University Teaching Hospital, University of Abuja, Teaching Hospital and University of Ilorin Teaching Hospital.

Use of Information is seen as the utilisation of information by diabetic patients to prevent or mitigate the effect of people with diabetes on them.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Conceptual Framework

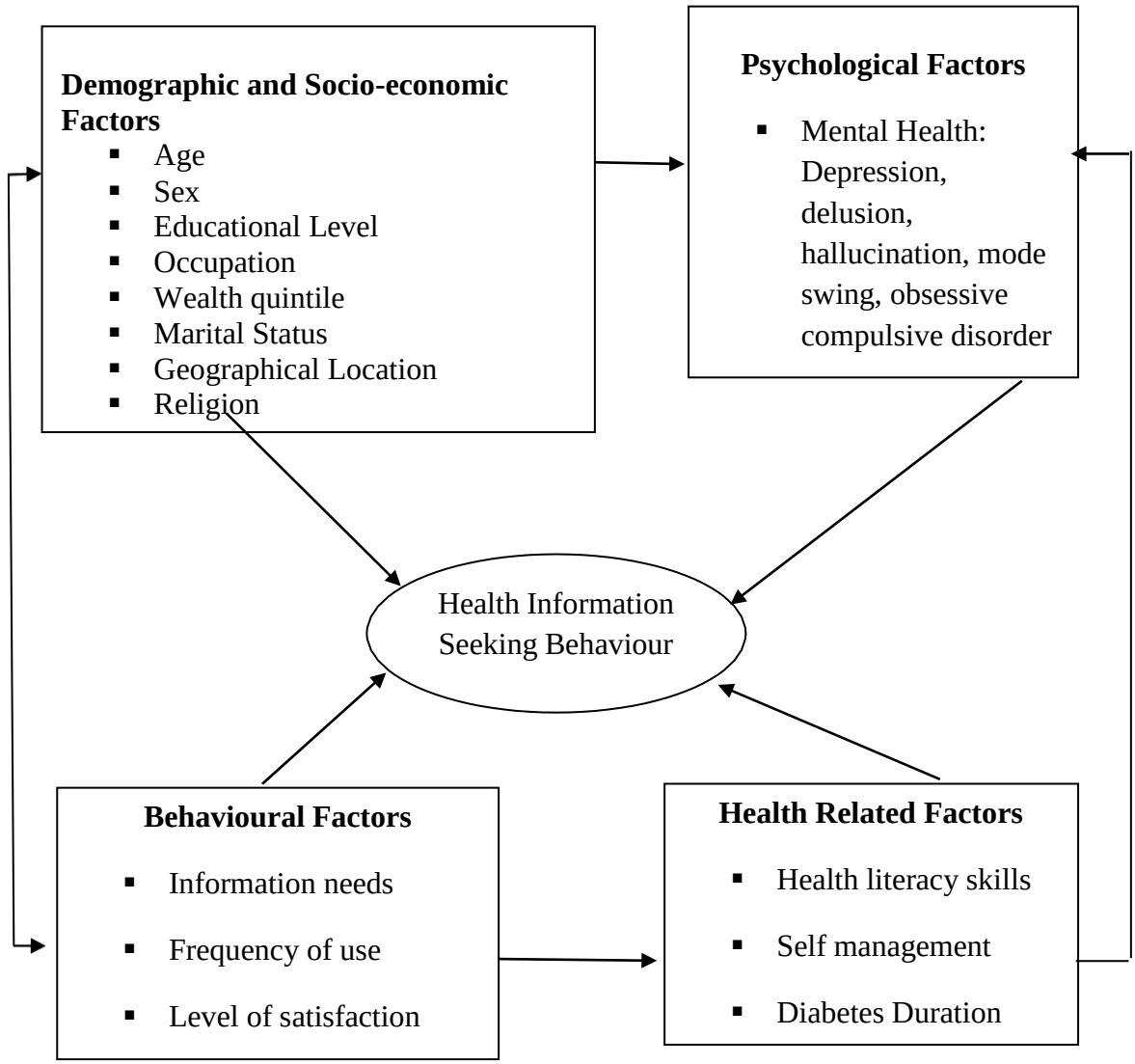

Figure 1: Schematic Diagramme Showing the Relationship Between the Variables Studied

Source: Adapted from different studies in literatures

2.1.1 The concept of diabetes

Diabetes mellitus, is often called diabetes, is a chronic disease associated with abnormally high blood glucose levels (sugar). It occurs when the pancreas cannot produce sufficient insulin or "when the body cannot effectively use the insulin it produces" (Narjis 2021). Hyperglycaemia (or high blood sugar) results from uncontrolled diabetes and, over time, canbe detrimental to the body's systems, such as the heart, blood vessels, eyes, kidneys, and nerves (International Diabetes Federation, 2021). There are three types of diabetes, namely, Type 1 diabetes, Gestational diabetes, and Type 2 diabetes.

i. Type 1 diabetes is onset in juveniles or childhood. It is characterised by deficient insulin production, and the patient requires daily insulin administration. The cause of type 1 diabetes is unknown, and it is not preventable with current knowledge (Syed 2022).

ii. Gestational diabetes is onset or first detected during pregnancy. It is often diagnosed "through prenatal screening rather than reported symptoms" (Syed 2022).

iii. Type 2 diabetes "results from the body's ineffective use of insulin". Ninety percent of people with diabetes worldwide have type 2 diabetes, and it is largely because of excess body weight and the lack of physical activity. While this type of diabetes is typically found in adults (40 years and over), it is increasingly occurring in children (Syed 2022).

Recent statistics show that more than 220 million people worldwide have diabetes. In 2014, an estimated 3.4 million people died from the consequences of the disease, and the World Health Organization (WHO) projects that diabetes deaths will double before the year 2030. In

Nigeria, the WHO estimates that there are just under 900,000 diabetics and predicts that this number will grow to 1.3 million by 2030 (International Diabetes Federation, 2013). Diabetes is a major public health problem in developed and developing countries (International Diabetes Federation, 2021). While the focus is geared towards the clinical treatment and management of the disease, patients must share increased responsibility for managing their health and diabetes. With relevant knowledge, lifestyle changes, and information, diabetic patients can improve and manage their condition effectively. Diabetic patients are encouragedto take responsibility for managing their medical condition. Diabetes involves a more significant amount of awareness about diet, exercise, medication administration, and the early recognition of plausible complications. Patient's knowledge of diabetes and the consequences of the disease are most important for the successful management of the disease. Hence, information provision is especially important for managing diabetes (Russell *et al.*, 2014).

People with diabetes are more susceptible to other diseases and often have a worse prognosis from them. Diabetes causes serious complications and can lead to poor quality of life (World Health Organization, 2021). Yet, people with diabetes can reduce the occurrence of these potential complications through lifestyle management with the proper utilisation of health information resources. There are many secondary prevention (glucose control and blood pressure control) and tertiary prevention (screening for eye, foot, and kidney abnormalities) measures available to prevent the onset of diabetes and decrease the severity of diabetes complications (World Health Organization, 2021). Strategies that would decrease the burdenof diabetes are not used regularly, resulting in increased morbidity, complications, and expenses (Syed, 2022). People with diabetes who comply with their regimen and maintain strict glycemic control have lower rates of complications (World Health Organization, 2021).

Training and education to help people self-manage their diabetes helps prevent unnecessary health care utilisation and hospitalization (WHO, 2022). People who have increased morbidity and mortality risk, particularly those with a disability or chronic diseases such as diabetes, are more likely to engage intensely with health information resources (Izquierdo *et al.,* 2021).

2.1.2 Health information sources

Health information sources refer to the various channels, platforms, and entities that disseminate information related to health, wellness, medical conditions, treatments, and healthcare services. These sources serve as repositories of knowledge, providing individuals, healthcare professionals, researchers, policymakers, and the public with access to valuable information to make informed decisions about health-related matters.

Alduraywish *et al*. (2020) emphasize the crucial role of reliable health information sources in establishing a solid knowledge base about health, particularly in light of the widespreadadoption of the internet and social media. With over half of the global population now using the internet, and a growing number in Saudi Arabia exceeding 64%, these platforms have become primary sources for medical information. However, despite their accessibility, social media, websites, and search engines often present uncertainties. There is mounting evidence that the rapid dissemination of unverified news from untrustworthy sources, coupled with the absence of vetting mechanisms for accuracy and credibility, poses significant risks to individuals' health.

Acquiring health information can occur in formal and informal social contexts that are not intended as venues for health information exchange, yet the exchange arises through social encounters. Examples of formal and informal contexts of health information exchange include

obtaining health information before or after worship services, in the workplace, and while having lunch with friends. These illustrations are consistent with the general precept that people use well-established habits to acquire health information, habits that frequently prioritize ease of access and interpersonal trust in the source (Altizer *et al.,* (2014). Altizer *et al.* (2014), in an in-depth analysis of how elders seek and disseminate health information, revealed that friends were the dominant source of health information for older adults. The family was notably missing as a source of health information. Participants described how friends frequently shared information about health, including basic information about illnesses or specific symptoms. In most situations described in their study, participants talked about how conversations at churches or other recreation sites for older adults often shifted to health topics. During an interview with a respondent, they revealed that they receive health information from social gatherings. However, in some instances, the transmission of health information within group social settings was purposeful and intentional. For example, one African American female described how her church provides health-related seminars, the mostcommon social setting for older adults. To ease the potential for discomfort, men and women have separate meetings. The study also revealed that respondents obtained their health information during seminars at church. Health information was also obtained from several media sources. The dominant media source for health information was television programming. In most cases, health information was disseminated as part of a broader message: it typically was not focused on health content (Altizer *et al.,* 2014).

2.1.2.1 Types of health information resources required by diabetic patients

Health information resources are all the media for storing health information. Ode *et al.* (2021) defined health information resources as all published and unpublished knowledge on

all aspects According to Ode *et al.* (2021), health information has been variously described as the “foundation” for better health, as the “glue” holding the health systems together, and as the “oil” keeping the health systems running. There is, however, a broad consensus that a strong health information system (HIS) is an integral part of the health system as a whole, the operational boundaries of which include all resources, organizations, and actors that areinvolved in the regulation, financing, and provision of actions whose primary intent is to protect, promote or improve health (Abule and Garba 2021).

Health information resources are grouped into two, namely print and non-print resources. The print resources include book materials such as journals, newspapers, newsletters, magazines, brochures, pamphlets, treatment fact sheets, and many more. Non-book materials include cassettes, tape videos, CD-ROM technology, e-books, e-journals, and MedlinePlus.gov. MedlinePlus is the National Institutes of Health's Website for patients, their families, and friends. Produced by the National Library of Medicine, it provides information about diseases, conditions, and wellness issues in language you can understand.

MedlinePlus offers reliable, up-to-date health information anytime, anywhere, and for free (http://www.nlm.nih.gov/medlineplus/). One can use MedlinePlus to learn about the latest treatments, look up information on a drug or supplement, find out the meanings of words, or view medical videos or illustrations. One can also get links to the latest medical research on your topic or learn about clinical trials on a disease or condition. Abule and Garba (2021) identified health information resources, including newsletters, magazines, newspapers, posters, exhibits, visual aids, and leaflets. Anyaoku and Nwosu (2017) submitted that access to relevant health information resources is essential for helping people to make good decisions to enhance their health and well-being. The authors identified health information resources to

include textbooks, journals, newspapers, and magazines, patents and standards, handbooks and manuals, dictionaries, gazetteers, encyclopedias, atlases and maps, calendars and diaries, projects, theses and dissertations, tapes, videos, films, cassettes, and magnetic tapes. Other health information resources are microforms and electronic health information resources capable of meeting the health information needs of diabetic patients.

2.1.2.2 Sources of accessing health information resources required by diabetic patients

Kalankesh *et al.* (2019) observed that finding information is a complex communication activity requiring access to various information resources to solve personal, social, and occupational problems. An overview of research in information needs and information-seeking behaviour shows that most studies have focused on specific user groups in recent years. Students are among these groups, and understanding their information-seeking behaviour is very important. Access to relevant health information will reduce their anxiety in dealing with health issues and consequent stressful situations, increase their abilities to overcome risk factors, contribute to faster recovery, increase self-care capabilities, and lead to more active participation in decision-making processes regarding their health.

Finding information is the purpose of information-seeking behaviour, traditionally the subject of studies in the information field. Searching for information results from a secondary need that comes from a person's more basic need, created by the roles of his life or the environment to which he belongs. To begin the search for information, one must first overcome personal, interpersonal, or environmental barriers. In addition, active information search is a behaviour in which individuals perform targeted searches -that come from one of their needs- to obtain

information. A similar definition has been made: information seeking is "a targeted achievement of information through information carriers" (Pálsdóttir, 2011).

Health professionals constitute a very important source of access to self-management information because they have the knowledge base to provide patients with reliable and trustworthy health information. Reports from developed countries show that although patients generally obtain health information from many sources, many prefer to receive health information from their healthcare providers (Pullen *et al.*, 2011). Other sources of health information include the Internet. This digital medium is a new and valuable source of access to health information. Available on the Internet are various patient-centered websites offering disease-specific information, education, and advice to patients at different level of need. Peer organizations consisting of patients with similar conditions are good platforms and sources for sharing of self-care and coping information. Libraries are also sources of quality health information. Libraries can provide access to a range of authoritative materials, such as books, specialized journals, and monographs on various health issues that are potentially useful to patients. Health sciences librarians can also play an important role in pointing consumers toward authoritative health information online (Anyaoku and Nwosu, 2017)

According to Article 19 of the Universal Declaration of Human Rights, access to information is considered a universal right, and access to health information is also considered a prominent method to enhance health and improve life quality (IFLA, 2012). Zahedi and Zahedi (2012) averred that the provision of various information resources based on the needs of library customers, helping them to use information resources, creating free access to information resources, respecting the rights of library customers, and providing accurate and authentic

responses to their information requests are among library customers' rights, which have been mentioned in the ethical codes for librarianship. Patients and recipients of health services are a special group of library customers. Some of the most important and common issues in the ethical codes of library and information science and standards for hospital libraries in different countries, and in the IFLA Code of Ethics, related to information recipients are as follows: respect for the right to free access to information, confidentiality and privacy of received information, fair and equal access to information, the highest level of access to library services with organized, useful, reliable, and unbiased resources, training users regarding information retrieval and using library services, respectful behaviour by information service providers, promotion of information literacy and client information skills and continuing training and lifelong learning for all users, especially patients and their families, assurance of customer satisfaction, and continuous assessment of current and future information needs (IFLA, 2012)

Patients are required to be exposed to adequate and opportune information that influences healthcare to understand the current situation and treatment of their health as well as their families; take over the responsibility of coordinating healthcare and decreasing duplication of services while multiple healthcare is involved and provide a long-term personal health record which displays their health conditions and care services received over the time (Washington 2014).

The "right to access health information" is patients' second right to benefit from consumer health information services. The presence of a suitable platform for patient access to health information at any time and place, regardless of physical and mental conditions, is another right of patients. Regarding the importance of hospital libraries and information services,

Marshall (2017) emphasizes using new technologies to deliver patient information. He considers patients' conditionss an important factor in determining the type of technologies provided to deliver information to them. Positive effects of using the modern hospital libraries of an electronic supportive system on the quality of lifelong learning. Quick and easy access to information is one of the important factors in increasing patients' use of health information. The higher the access to health information, the greater the likelihood of using the information will be. Observing these rights is one of the aspects of justice in accessing health information.

Healthcare professionals should provide conditions for patients and their families to ask questions about the disease and should behave toward them cheerfully and respectfully. Meanwhile, healthcare professionals should provide them with useful and understandable information resources. Healthcare professionals should place their professional behaviour with patients at the forefront of their goals. Patients' confidentiality and privacy should be taken into account not only by healthcare professionals but also by librarians and information providers. Necessary information about the disease, treatment methods, risks of treatment, and legal issues should first be put at patients' disposal by healthcare professionals in plainlanguage. However, for some reasons, such as lack of time, they have left this task to other individuals, such as nurses, medical librarians, and health information professionals (Ashrafi- rizi *et al.*, 2019).

Sources of accessing health information are the channels or mediums through which diabetic patients get health information. It is imperative to know the kind of health information packages and communication channels that diabetic patients prefer to effectively communicatethe desired health information. Several sources exist through which diabetic patients can access health information resources. According to Naidoo (2012), several sources are used to

bring health information to an audience, such as functions, churches, and town counselors. The author further advanced that, in traditional African societies or settings where most residents are illiterate, providing health information to such categories of people is through town criers. On the contrary, Fox and Purcell (2010) pointed out the sources of health information most accessed by people are personal experience and friends/relations/neighbours.

Other sources identified by Fox and Purcell (2010) included television and radio. Radio is one of the fastest, most powerful sources of accessing health information, and many countries have used radio to disseminate health information to people. Radio reaches people at all levels who understand the language of transmission. Radio use as a mass communication tool for disseminating health information has long been recognized. Radio has been used as a tool for learning and a community address system. Angya (2012) supported that, in remote regions without a telephone, people use the radio to announce meetings, funerals, and weddings. Diabetic patients learn about new government programmes and plans on the radio and hear about community events and issues. Television adds a second dimension to radio broadcasting as a major source of health information for diabetic patients.

Furthermore, sources of health information could be categorized. Firoozeh *et al.* (2016) categorized health information sources for diabetic patients into interpersonal sources, traditional media, and new media. Interpersonal sources refer to obtaining information from people such as practitioners, nurses, other health care providers, charities, or support organizations for diabetic patients, family members, friends, co-workers, other diabetic patients, and medical librarians. Traditional media include news, television, radio, newspapers,medical journals, medical magazines, medical brochures, medical booklets, and medical

posters. The new media include satellite TVs, the Internet, social networks, and other similar media.

Anyaoku and Nwosu (2017) reported that health professionals constitute a very important source of access to self-management information because they have the knowledge base to provide patients with reliable and trustworthy health information. Reports from developed countries show that although patients generally obtain health information from many sources, many prefer to receive health information from their healthcare providers (Twyford Consulting, 2008; Fox and Purcell, 2010). Other sources of health information include the Internet. This digital medium is a new and valuable source of access to health information. Available on the Internet are various patient-centered websites offering disease-specific information, education, and advice to patients at different levels of need. Internet services havebecome increasingly important to improve access to health information and health care, including online renewal of prescription medications and making appointments. Peer organizations consisting of patients with similar conditions are good platforms and sources for sharing self-care and coping information. Libraries are also sources of quality health information. Libraries can provide access to various authoritative materials, such as books, specialized journals, and monographs on various health issues that are potentially useful to patients. Health sciences or medical librarians can also play an important role in pointing consumers toward authoritative health information online (Anyaoku and Nwosu, 2017). All these sources can be harnessed to provide self-management information for patients with diabetes.

2.1.3 Health information resources utilized by diabetic patients

Utilisation of health information resources is exploiting health information resources to satisfy health needs. Anyaoku and Nwosu (2017) defined the utilisation of health information resources as the patients' ability to identify and obtain relevant, accurate, and suitable health information to satisfy health information needs. For health information resources to be effectively utilized to some extent by diabetic patients, they have to be accessible. Lack of access to health information resources is a problem because this may create a vacuum in patients' understanding of the disease and ultimately affect their perception of their capability to manage the disease (Anyaoku and Nwosu, 2017). The authors also revealed the sources of accessing health information, including health professionals, libraries, television and radio broadcasts, the internet, churches, family, friends, and relatives.

Mental health professionals, through the first decade of diabetes, saw that many people living with diabetes felt compelled to sort through a potentially overwhelming amount of health information resources to keep up with and stay current on issues important to their health. More recently, health communication researchers have shown that people with diabetes use health information resources as the main strategy to cope with and manage the disease. Angya (2012) reported that individuals used health information resources for diverse reasons ranging from curiosity to self-diagnosis and treatment, whose absence can lead to interrupted treatmentand self-medication. Nathan (2014) asserted that health information resources used by patients include medical newspapers and magazines, medical pamphlets, and medical brochures, as well as internet facilities for locating general and specific health information, making social connections, fostering a sense of community, advocating and escaping from the stress of living with the disease. Naidoo (2012) indicated that more diabetic patients are inclined to search the

Internet for their information, and some may prefer to receive information by word-of-mouth and personal contact; the Internet and conventional methods such as brochures may also be useful.

Anyaoku and Nwosu (2017) reported that diabetic patients who use the internet for health information seem informed about the disease and report more use of active coping strategies. Diabetic patients may be unable to utilise information resources in print formats such as newspapers, brochures, and the Internet if they are not educated and computer literate. Such diabetic patients may prefer to receive information by word-of-mouth and personal contact.

Diabetic patients use information resources to acquire health information that may help them manage their disease. Jones (2013) emphasized that diabetic patients use treatment fact sheets, pharmaceutical company brochures, medical newsletters, and leaflets. However, as mentioned above, the author lamented that access to health information resources and other gray health literature can be difficult given its limited dissemination and integration into the usual streams of health information systems. As a result, these information resources are not easily available to diabetic patients. Other health information resources used by diabetic patients, as identified by Fox and Purcell (2010), include medical videotapes, medical dictionaries, medical proceedings, medical journals, and medical billboards. They further reported that, in a more educated, civilized, and developed society, diabetic patients use online medical resources such as medical e-books and e-journals, medicos, MedlinePlus, and ClinicalTrails.gov, which are interactive.

2.1.4 Extent of utilisation of health information resources by diabetic patients

Health information utilisation is the patients' ability to identify and obtain relevant, accurate, and suitable information to satisfy health information needs. Lack of utilisation of health information is a problem because this might create a vacuum in patients' understanding of their diseases and ultimately affect their perception of their capability to manage these diseases (Anyaoku and Nwosu, 2017). The utilisation of health information depends on access to health information sources. Jones (2013) posited that health information access comprises physical availability and personal retrievability. Physical availability is the existence of health information resources and physical access to the resources. The physical access sources include print and electronic formats such as books, pamphlets, and the Internet. It also includes an interpersonal exchange of facts, advice, and instructions between patients, health professionals, or peers. To achieve physical access to the resources, the diabetic patient must know the information, where it can be found, and how to navigate the institutional structures to reach it. The individual may also need help understanding and acting on health information resources, especially written information (Colledge *et al.,* 2008). Personal retrievability is the patient's ability to gain access to health information resources from the available sources.This may depend on factors such as health information literacy level and relevance of the information to the recipient. The utilisation of health information resources depends to a large extent on the diabetic patient's health information literacy. Naidoo (2012) defined health information literacy as the "ability to obtain, process, and understand basic health information resources and services needed to make appropriate health decisions and follow instructions for treatment". Health information literacy is the degree to which individuals can obtain, process, and understand basic health information resources and services needed to make appropriate health decisions (Centers for Disease Control and Prevention, 2017). Factors that contribute to

a person's health literacy range from the person's general literacy, which includes the person's ability to read, write, and understand written text and numbers, or a person's ability tounderstand the complexity of the information being presented (Naidoo, 2012). Limited health information literacy affects people of all ages, races, income levels, and education levels to utilise health information sources effectively. Among diabetic patients, inadequate healthinformation literacy is independently associated with poor glycemia control and higher rates ofretinopathy (a form of non-inflammatory damage to the retina of the eye). Inadequate health information literacy may contribute to the disproportionate burden of diabetes-related problems among disadvantaged populations (Anyaoku and Nwosu 2017).

Various scholars have revealed the extent of utilisation of health information resources by diabetic patients. Firoozeh *et al.* (2016) found that health practitioners and family members had the highest number of visits, and medical librarians had the lowest number. The study also revealed that new media such as satellite TV, the Internet, social networks, and other similar media were used less than other information sources; however, the Internet has been used more often than satellite TVs. Among traditional media (news, television, radio, newspapers, medical journals, medical magazines, brochures, booklets, and posters), television, radio, and news had the highest, and libraries and emergency phone lines had the lowest number of uses.

Many patients can access health information from televisions, medical books, newspapers, and the Internet. These are information resources found in a standard library. Yet quite a very high percentage of these patients do not access health information from the libraries (Anyaoku and Nwosu 2017). This calls for a re-evaluation of the roles of medical and public librarians in Nigeria as sources of health information. The medical library as an information resource has the potential to provide access to quality, reliable, and up-to-date health information resources

to patients with chronic diseases. Gathoni (2012) noted that, in regions that lack adequate information systems, librarians could play a role in facilitating access and use by information seekers because they are aware of the needs of users, familiar with new information and communication technologies to meet local needs and have access to some current sources of evidence-based information. Medical librarians in many countries have expanded their role by developing diverse initiatives to provide patient information. For instance, The United States National Library of Medicine maintains important consumer health information websites such as MedlinePlus and ClinicalTrials.gov. These websites provide reliable, up-to-date, and accessible information for the consumer as well as healthcare professionals (Pullen *et al.*, 2011)

2.1.4 Health information seeking behaviour of diabetic patients

Utilising health information resources is an important part of coping with diseases. It includes communicative and cognitive activities like seeking, avoiding, providing, and interpreting information (Naidoo 2012). Utilisation of health information resources is complex in that people's information needs and behaviours vary throughout their illnesses and along with the availability, format, quality, and sources of information, hence the need to assess health information resources utilisation. Similarly, Park *et al.* (2020) posited that the necessity of searching for and utilising health information is affected by the patient's needs, the amount and type of information available, mental background, and estimated cost. A person with adequate knowledge about a disease naturally would not seek new information. Lalazaryan and Zare-Farashbandi (2014) identified factors that could prevent one from actively utilizing health information resources as financial problems, time constraints, hopelessness and confusion, poor physical and psychological condition, and illiteracy.

A diabetic patient can actively or passively utilize health information based on their situation to reach medical care decisions. Among the advantages of active information utilisation as revealed by Firoozeh *et al.* (2016), is the reduction of anxiety, uncertainty and better control over the disease. In some situations, the necessary health information is passively absorbed from the surrounding environment; the diabetic patient might believe there is no need to seek and utilise health information actively. Such a patient may not be inclined to ask questions from the doctor because they believe that the doctor will provide all necessary information. Utilisation of health information resources by diabetic patients may help the diabetic patients manage their disease and extend their life expectancy.

Diabetic patients seek health information resources from curiosity about self-diagnosis to treatment. It is imperative to mention that they are adequately empowered with health information resources for proper utilisation to make the right decision about their health (Naidoo 2012). The role of health information resources to diabetic patients cannot be ignored; information is vital to relieve pain and make physical and mental health decisions. The author further emphasized that the utilisation of health information resources helps extend and improve the quality of reducing complications associated with a disease if properly utilised. The non-utilisation of health information resources can lead to interrupted treatment and self- medication, which can worsen the situation.

2.1.5 Health information literacy of diabetic patients

Health information literacy among diabetic patients refers to their ability to access, understand, evaluate, and apply health information related to diabetes management effectively. Health information literacy empowers diabetic patients to take an active role in managing their

condition, make informed decisions, and maintain optimal health and well-being. It plays a crucial role in enhancing patient engagement, self-efficacy, and adherence to diabetes care recommendations. According to Olaide (2013), health information literacy connotes the ability to comprehend health-related issues and apply the knowledge in making decisions about one's healthcare needs. Going by this assertion, a seemingly literate person could still become illiterate when confronted with health information that may overwhelm him. According to the study, about 40 percent of the population has limited health literacy, even in advanced countries such as the United States. The resultant effect of the prevailing limited healthinformation literacy in Nigerian society has put an ordinary Nigerian at a less privileged healthstatus, leading to more frequent hospital visits, increased health care costs, reduced net productivity, and enhanced both morbidity and mortality rates.

Health literacy directly affects health outcomes (Koh *et al.*, 2012). Health literacy is "the degree to which individuals can obtain, process, and understand basic health information and services needed to make appropriate health decisions" (U.S. Department of Health and HumanServices, 2015). Furthermore, only 12% of the adult population possesses what the National Network of Libraries of Medicine (2014) designates as "proficient" health literacy, making "limited health literacy…a major public health problem" (Johnson *et al.*, 2011). Even highly educated individuals often lack health literacy, and "14% of adults (30 million people) have Below Basic health literacy" (U.S. Dept. of Health and Human Services, 2015). Low levels of health literacy are particularly prevalent among older, minority, immigrant, and low-income populations.

2.1.6 Challenges facing the information seeking behaviour of diabetic patients

In the study by Kahouei *et al.* (2013) titled "Use of Information Resources for Clinical Decisions by Nurses and Nursing Students, and Its Barriers after Introducing Information Technology," it was found that the lack of belief in evidence-based performance and lack of skill in using the library were two important barriers to searching by the students. The inability to find appropriate articles, difficulty understanding scientific texts, and lack of access to scientific texts in clinical settings revealed a significant difference between nurses and nursing students. However, in our study, there were not any of the factors mentioned in the studies of Kahouei *et al*. (2013) as barriers to access to health information, time-consuming processes of access to information as well as the lack of access to information resources were determined as barriers to information access by the university students in Tabriz University of Medical Sciences in Iran. To overcome the barriers related to time-consuming access to health information and lack of access to information resources, it seems that authorities of the University of Medical Sciences should take steps to provide high-speed internet and purchase all databases providing health information.

2.2 Theoretical Framework

The study used the sense-making theory, the risk information seeking and processing (RISP) model, and the Information Utilisation Model by Lenz 1984. The sense-making theory was developed in 1972 by Dervin and colleagues. The model indicated that information-seeking and information-using occur when individuals cannot progress through a situation without forming some new “sense” about something. The information needs are thus situationally confined. However, sense-making is implemented in terms of four constituent elements,

namely: the situation in time and space, which defines the context in which information problems arise; a gap, which identifies the difference between the contextual situation and the desired situation (e.g., uncertainty); an outcome, that is, the consequences of the sense-making process; and a bridge, that is, some means of closing the gap between situation and outcome (Ntlotlang 2016).

The risk information seeking and processing (RISP) model (Griffin *et al.*, 1999) and health information acquisition model (HIAM) (Freimuth *et al.*, 1989). RISP was developed to explain the difference in information seeking and processing, specifically within the context of risk. The model focuses on characteristics of individuals that might lead them to seek and process information about health in different ways. RISP proposes that seven factors namely: individual characteristics, perceived hazard characteristics, affective response to the risk, felt social pressures to possess relevant information, information sufficiency, one's personal capacity to learn, and beliefs about the usefulness of the information in various channels – willinfluence the extent to which a person will seek out this risk information in both routine and non-routine channels and the extent to which they will spend time and effort analyzinginformation.

The information utilisation model is a model of health information utilisation propounded by E.R. Lenz in 1984. Lenz defined health information utilisation as the patients' ability to identify and obtain relevant, accurate, and suitable information to satisfy health information needs. In this model, information utilisation is a part of the decision-making process. Itconsists of six stages: information utilisation stimulus, setting information goals, decision- making regarding whether to actively utilize information, search behaviour, information

acquisition and codification, and decision-making based on the adequacy of acquired information.

Information utilisation stimulus can be derived from within the person (previous experiences regarding specific symptoms or injuries) or from the surrounding environment (death of a friend, negative comments of acquaintances about health habits, or TV programs). This stimulus leads to the identification of the discrepancy between available information and information needed by the patient, leading to the start of the information utilisation process. Some of these stimuli are Identifying a problem that needs to be prevented or solved, a decision that has to be made, a goal that needs to be achieved, or placement in an unfamiliar orthreatening situation.

Setting information goals comes after the information utilisation stimulus; in this stage, for instance, when a person is in a decision-making situation, available information must be used to determine the goals that define the conditions of utilisation of information. Information goals lead to concentration and limit unnecessary and side activities. According to the model, based on these goals, the patient determines the time frame in which the information needs to be gathered, the information sources used, the types of information sought, and other similar factors.

In decision-making regarding whether to utilise information actively, Lenz explained that identifying the stimuli, with or without explicit goals, leads to deciding whether it is necessary to utilize information actively or not. This decision is derived from the amount of previous information available, mental background regarding the problem, and anticipated cost-benefit ratio of information utilisation. If people believe they have enough information, they will

naturally not seek more. Also, suppose situations such as financial difficulties, time constraints, hopelessness, confusion, poor physical and mental health caused by the disease, or willful ignorance regarding the information can outweigh the anticipated benefits of active information utilisation. In that case, people will refuse to utilise information actively. Reduction of stress, anxiety, uncertainty, and increased control over the disease are among the benefits of active information utilisation. Patients might believe active information utilisation is unnecessary because all needed information can be gained passively from the environment. People with these beliefs never ask questions from their doctors because they believe that the doctors will provide them with all the necessary information.

Search behaviour, this stage to Lenz (1984), occurs if a person decides to utilize information actively. The extent of the search is determined based on the two factors of some alternatives investigated and the number of dimensions of each alternative. The extent of the search can differ from an in-depth search to superficial information utilisation and directly relates to the amount of information gathered. However, Lenz (1984) states that one must remember that not every search leads to finding relevant or new information. The search can be carried out in two ways: impersonal, in which the information is gathered from inanimate sources such as publications, reference services, or strangers or personal, in which the patient gathers the information from people familiar to them. The model stipulates that the information utilisation process is usually a mixture of these two methods and a personal search is often preferred over an impersonal one.

Information acquisition and codification is the fifth state of Lenz's Information Utilisation theory, in this stage, the author maintained that, after actively utilizing information, the

information seeker will evaluate the gathered information and determine whether the new information is new and relevant or new and irrelevant. New and relevant information is memorized and might act as a stimulus for encouraging further search behaviour. Decision-making based on the adequacy of acquired information is the last stage of Information Utilisation theory which states that, as soon as the information seeker gathers the necessary information, the adequacy of this new information is evaluated to determine whether information utilisation needs to continue or stop. The criteria for this evaluation are subjective.

This evaluation can be done based on comparing information needed and obtained, a cost-benefit analysis of information utilisation, or information goals determined before the information utilisation process. The information Utilisation model states that factors such as exhaustion, boredom, hopelessness, urgency for taking a certain action, and difficulty of the information utilisation process can lead to premature termination of the search. In contrast, curiosity and interest can help people continue searching for more information. The final outputs of this search process are cognitive and behavioral changes in the information seeker. The Information Utilisation model is relevant to the present study in that it stipulates the stagesof the health information utilisation process for an informed decision which is the basis of the present study. With these stages of health information utilisation, diabetic patients would adopt the seeking and utilizing of health information that will help them treat, control, and manage diabetes. The model also states the sources of accessing health information and some factors that affect the utilisation of health information by patients, which are some of the variables of the present study.

2.3 Review of Related Empirical Literature

Anyaoku and Nwosu (2017) examined the extent of access to health information and sources for chronic disease patients in tertiary health institutions in South East Nigeria: implications for libraries' role. The study's main purpose was to determine the extent of patients' access to health information on their chronic illnesses. The study also ascertained sources of health information for patients in the two tertiary health institutions. The specific objectives are to determine the importance of access to health information for patients with chronic diseases, the extent of patients' access to disease-specific information, the extent of patients' access to treatment information, the extent of patients' access to coping information, and the sources of health information for patients with chronic diseases.

The research is a cross-sectional survey that used the questionnaire to collect data. The sample was 784 patients in two Federal Government Teaching Hospitals in South East Nigeria: University of Nigeria Teaching Hospital (UNTH), Enugu State, and Nnamdi Azikiwe University Teaching Hospital, Anambra State. These two hospitals provide a wide range of medical and surgical services to the people of South East Nigeria and also serve as referral centers to all other hospitals owned by the State Governments and private individuals in the zone. Participants were patients with chronic diseases attending the Medical and Surgical outpatients' clinics in the two hospitals. The study focused on patients with the following diseases: hypertension, diabetes, cancer, kidney diseases, HIV, and AIDs. The Medical Ethics Committee of the two institutions studied approved the study. The Patient Information Access Questionnaire was one of the instruments used to collect data for the dissertation study. The Patient Information Access Questionnaire reflected the structure of the European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life Group (EORTC QLQ-INFO

26) questionnaire. The EORTC QLQ-INFO 26 questionnaire items assessed the general level of information cancer patients received. Patient Information Access Questionnaire was however developed to suit the scope of the study. It elicited the importance of health information to the patients and the level of access to coping and treatment information they received from health professionals and other information sources. Access to disease information was measured using seven items ($\alpha = .827$) related to disease prognosis information. Access to coping information was measured using six items ($\alpha = .916$) that dealt with various aspects of coping with chronic diseases. Access to treatment information was measured using six items ($\alpha = .902$) that dealt with treatment and adherence issues. Response options for the information access variables were on a four-point scale: of (iv) Much information (iii) Some information (ii) Little information (i) No information. The questionnaire also measured sources of access to health information. Fourteen different sources were listed ($\alpha = .871$): Respondents rated how often they obtained information from the sources on a four-point scale of (iv) Very Often, (iii) Often, (ii) Occasional, (i) Not at all.

Regarding sources of information used, the study showed that doctors were the major source of health information, with 756 (93.7%) indicating receiving health information (occasionally to very often) from this group of health professionals. Others are Pharmacists 551 (70.3%), Nurses 535 (68.2%) and other patients, 482 (61.5%), Churches 459 (58.5%), family (57.8%) and Chemist or patent medicine dealers, 279 (35.6%). Notable percentages also have access to information from mass media sources such as television 531 (67.7%), books 345 (44%), newspapers 341 (43.5%), pamphlets 308 (39.3%), posters 301 (38.4%), and the Internet 192 (24.5%). The least source of health information is the library.

The majority of respondents, 633(80.7%) did not access health information from the library. Doctors were the predominant source of health information. A very high percentage (93.7%) of the respondents indicated receiving information from this group of health professionals. This result is consistent with findings from other parts of the world, which reported that health professionals, especially doctors, are the predominant, highly trusted, and preferred sources of health information for patients with chronic diseases. Results also indicated that some patients use other mass media sources such as television, books, newspapers, pamphlets, booklets, and the Internet to obtain health information. Notably, 24.5% of Internet usage found in the study is within the reported range of 4.0% to 41.5% of Internet use by cancer patients (Muusses *et al.*, 2011). This indicates that the Internet, as a new source of health information, also has the potential to be exploited to provide these groups of patients in Nigeria with self-management information.

Kalantzi *et al.* (2015) studied the information-seeking behaviour of patients with diabetes mellitus: a cross-sectional study in an outpatient clinic of a university-affiliated hospital in Athens, Greece. The purpose of this study is to examine the information behaviour of diabetic patients, a relatively unexplored field of diabetes care, including their information needs, resources used, obstacles encountered, and degree of satisfaction with diabetes-related information acquisition. A survey was used for the study. Participants were prospectively recruited from patients being followed up at the outpatient Diabetes Clinic and the Diabetic Foot Clinic of the University-affiliated "Laiko" General Hospital in Athens, Greece. Participants' socio-demographic and diabetes-specific data, including gender, age, urban or rural domicile, marital status, educational attainment, self-reported personal income, years since the first diagnosis of DM, Type of DM (1 or 2), treatment (oral hypoglycemic agents

(OHA), insulin or diet), number of visits to the outpatient diabetes clinic in the previous semester and most recently measured HbA1c level (extracted from the patient's medicalcharts) were recorded. Participants completed a brief printed, previously validated questionnaire that consisted of 57 items and used plain language. Apart from demographic andDM-related data, it assessed patients' information needs (15 questions), information sources (18 questions), obstacles to information seeking (11 questions), and degree of satisfaction withtheir current ability to seek information. Qualitative variables are presented as absolute and relative frequencies (%). Comparisons between categorical variables were tested using contingency tables and calculating the Chi-square test and Kendall's tau test for ordinal data. The Spearman's correlation test evaluated associations and correlation coefficients between the clinical parameters. All reported p-values are from two-sided tests and compared to a significance level of 5%. Data were analysed using SPSS for Windows version.

Kalantzi *et al.* (2015) examined diabetes-related sources of information. They revealed that the majority of them (94.6%) reported that they relied on their physicians as their main source of information (especially for patients with lower education, lower income, and worse DMcontrol), followed by the ophthalmologist (31.5% of participants, especially for males, with longer duration of DM, more visits to the clinic and better DM control). The broadcast media, i.e., television and radio, were ranked third in importance (15.3% of participants, especially formales of younger age, higher education, and better DM control). Relatives/friends (7.8%), books (6.4%), nurses (1.5%), pharmacists (1.0%), and other information sources were ranked much lower in importance. It is also of note that although "Internet usage" as a whole was limited (only 5.4% of the participants considered it as an important source of information for DM), in the younger age group of patients (<40 years), which was a minority of the patients

that took part in this study (11.3%), the internet was considered as a quite important information source (30.4% vs. 2.2% for those >40 years old). Apart from age ($p < 0.001$), Internet usage as an important information source was associated with having Type 1 DM, having higher education and income, lower duration of the disease, being followed up in the Diabetes Clinic vs. the Diabetic Foot Clinic, and having better DM control. Moreover, the questionnaire specifically explored the reported frequency of internet usage as an information source for DM. Most patients (71.9%) reported that they never used the Internet. In comparison, in total, 91.1% of the participants reported they used the Internet at a frequency ofonce a month or less to seek information about DM.

Sayakhot and Carolan-Olah (2016) also investigated which sources of information women with Gestational Diabetes Mellitus (GDM) required or expected and which were used most often. With multiple responses allowed, women reported that they required or expected information from their GPs (64.2 %), followed by diabetes educator nurses (45.9 %), diabetes support groups (33.9 %), internet (32.1 %), and endocrinologists (19.3 %). The most helpful sources of information were diabetes educator nurses (32.6 %), followed by general practitioners (GPs) (20.2 %), diabetes support groups (19.1 %), and the internet (19.1 %).

Findings suggest that GPs neither provided information nor referred women to sources of information at the time of the diagnosis. This highlights an important point for clinical practice because it may help raise clinicians' awareness of this issue and provide women with the knowledge and information they need to promote healthy outcomes. General practitioners should identify sources of information for women at the time of diagnosis. The use of telephone calls or text messages to inform women of their diagnosis should be avoided to

minimise women's dissatisfaction with the manner in which they were informed. Women benefit from access to diabetes educators during their pregnancies by meeting their information needs. Discussion with a diabetes educator was important and the most useful source of information for most women in this study. It may be beneficial if women who require medical care throughout their pregnancy are also able to access a diabetes educator nurse for discussion of their information needs about GDM during pregnancy.

Kostagiolas *et al.* (2018) examined physicians' information-seeking behavioral paths for diabetes mellitus care: a qualitative comparative analysis of information needs, sources, and barriers. The research objectives were information needs, sources, and barriers to physicians' information-seeking behavior for diabetes mellitus care. The research design adopted has been informed by the theoretical approach by Wilson *et al.* (2002), which considers information seeking as a purposeful, goal-oriented approach to making better decisions. A five-point Likert scale was used to rate the importance of information needs (eight items), frequency of information resources (12 items) utilisation, the importance of barriers involved in seeking information (eight items), and finally, information satisfaction (single-item measurement. This study's data were collected through a questionnaire survey, which was distributed to theHellenic Diabetic Association (HDA) members who had registered an e-mail address. The questionnaire was also electronically uploaded to the HDA webpage (http:// www.ede.gr). In addition, the questionnaire was administered to the participants of the Pan-Hellenic Diabetes Conference, which was held in Athens. Overall, 159 medical physicians participated in our study out of the 700 questionnaires distributed primarily through e-mail to registered HDA users, resulting in a response rate of almost 23%. The majority of the sample comprised relatively young physicians (up to 50 years old – 89.9% of the sample) that have completed

their specialisation (83% of the sample) and were practicing pathology or general medicine (85.5% of the sample). Almost 60% of the study participants were working in a public hospital or social security healthcare centre. The sample exhibited equal representation of specialised physicians on diabetes mellitus and non-specialised ones. Moreover, on average, 70% of the sample treated more than six patients daily.

The study revealed the information sources consulted, including personal library (0.741). Hospital Medical Library (0.654), printed medical magazines (0.516), digital scientific medical databases e.g. pubmed (0.866), digital search engines (0.643), medical association webpages (0.697), online updating services (0.767), medical guidelines (0.671), personalcommunication with colleagues (0.758). The research findings demonstrate that many necessary conditions lead to information satisfaction: the use of digital sources, the eliminationof environmental barriers (such as the lack of time), and the existence of information and digital literacy. Hence, this study provides an explanatory lens on the conditions leading healthcare professionals to choose among different information sources to satisfy their information needs. In this study, digital sources (such as online scientific databases and search engines) were the most popular information sources used by diabetes physicians. In addition, DM physicians in this research were mostly satisfied with digital information sources, whereasinterpersonal and conventional sources were not considered equally important in their information satisfaction paths. The study by Kostagiolas *et al.* (2018) is related to the current study because they both examined the information-seeking behaviour of diabetic patients but differed in the methodology, population, and geographical location.

Mengiste *et al.* (2021) investigated information-seeking behaviour and its associated factors among patients with diabetes in a resource-limited country. This study aims to assess the

diabetes information-seeking behaviour and its associated factors among patients with diabetes in Debre Markos Referral Hospital, Amhara Region, Northwest Ethiopia. An institution-based cross-sectional quantitative study supplemented with a qualitative study was conducted among 423 subjects from March to April 2019. A structured questionnaire and in-depth interview were used to collect the required data from the study subjects. The data were entered using EpiInfo version 7.2.2. Data processing and analysis were conducted using SPSS version 23. Descriptive statistics and a binary logistic regression model were used for the quantitative study, and thematic content analysis was used for the qualitative study.

When participants were asked about their primary sources, 156 (88.6%) of them used health professionals as the primary source to obtain diabetes-related information. Other sources of information included books, the internet, brochures, mass media, family, friends, and magazines or newspapers. The qualitative study results showed that health professionals were the primary source of diabetes information among patients with diabetes. This study indicates that out of the total participants, the majority, 417 (98.6%), of patients with diabetes have a high level of trust in health professionals, followed by books, 376 (88.9%), and mass media, 312 (73.7%). The results of the qualitative study show that most patients with diabetes have greater trust in health professionals than in other sources of diabetes information.

Crangle *et al.* (2018) explored patient information needs in type 2 diabetes: A cross-sectional study of questions. This study analyzed questions about type 2 diabetes mellitus (T2DM) from patients and the public. The aim was to understand better people's information needs by starting with what they do not know, discovered through their questions, rather than starting with what we know about T2DM and subsequently finding ways to communicate that

information to people affected by or at risk of the disease. One hundred and sixty-fourquestions were collected from 120 patients attending outpatient diabetes clinics and 300questions from 100 members of the public through the Amazon Mechanical Turkcrowdsourcing platform. Twenty-three general and diabetes-specific topics and five phases of disease progression were identified; these were used to categorize the questions manually. Analyses were performed to determine which topics were significant predictors of questions asked by a patient or the public, and similarly for questions from a woman or a man. Further analysis identified the topics assigned significantly more often to the crowdsourced or clinic questions. These were Causes (CI: [-0.07, -0.03], $p < .001$), Risk Factors ([-0.08, -0.03], $p <$

.001), Prevention ([-0.06, -0.02], $p < .001$), Diagnosis ([-0.05, -0.02], $p < .001$), and Distribution of a Disease in a Population ([-0.05,-0.01], $p = .0016$) for the crowdsourced questions and Treatment ([0.03, 0.01], $p = .0019$), Disease Complications([0.02, 0.07], $p <$ .001), and Psychosocial ([0.05, 0.1], $p < .001$) for the clinic questions. No highly significant gender-specific topics emerged in our study, but questions about Weight were more likely to come from women and Psychosocial questions from men. There were significantly more crowdsourced questions about the time Before any Diagnosis ([(-0.11, -0.04], $p = .0013$) and significantly more clinic questions about Health Maintenance and Prevention after diagnosis ([0.07. 0.17], $p < .001$). A descriptive analysis pointed to the value provided by the specificity of questions, their potential to disclose emotions behind questions, and the as-yetunrecognized information needs they can reveal. The reviewed study relates to the current study in that both examined information seeking behaviour. But the current study went further to look at information utilisation. They however differs in geographical locations

Wang *et al.* (2020) examined health information needs regarding diabetes mellitus in China: an internet-based analysis. The study statistically analysed the questions about diabetes collected from 39 health websites, 151,589. These questions were divided into nine categoriesusing a convolutional neural network. The information needs of patients with diabetes are presented as follows: diagnosis: 34.95%, treatment: 25.17%, lifestyle: 21.09%, complication: 8.00%, maternity-related:5.00%, prognosis: 2.59%, health provider choosing: 1.40%, prevention: 1.23%, others: 0.58%, The elderly are more concerned about the treatment and complications of diabetes, while the young are more concerned about the maternity-relatedand prognosis of diabetes. The diabetes drugs most frequently mentioned by consumers are insulin, metformin, and Xiaoke pills. The most common complications are cardiovascular disease and diabetic eye disease. The study of Wang *et al.* (2020) is related to the current studyin that both examined health information needs but were carried out in different locations.

Kalantzi *et al.* (2015) studied the information-seeking behaviour of patients with diabetes mellitus: a cross-sectional study in an outpatient clinic of a university-affiliated hospital in Athens, Greece. The purpose of this study is to examine the information behaviour of diabetic patients, a relatively unexplored field of diabetes care, including their needs for information, resources used, obstacles encountered, and degree of satisfaction with diabetes-related information acquisition. A survey was used for the study. Participants were prospectively recruited from patients being followed up at the outpatient Diabetes Clinic and the outpatient Diabetic Foot Clinic of the University-affiliated “Laiko” General Hospital in Athens, Greece. Participants’ socio-demographic and diabetes-specific data, including gender, age, urban or rural domicile, marital status, educational attainment, self-reported personal income, years since first diagnosis of DM, Type of DM (1 or 2), treatment (oral hypoglycemic agents

(OHA), insulin or diet), number of visits to the outpatient diabetes clinic in the previous semester and most recently measured HbA1c level (extracted from the patients' medicalcharts) were recorded. Participants completed a brief printed, previously validated questionnaire that consisted of 57 items and used plain language. Apart from demographic andDM-related data, it assessed patients' information needs (15 questions), information sources (18 questions), obstacles to information seeking (11 questions), and degree of satisfaction withtheir current ability to seek information. Qualitative variables are presented as absolute and relative frequencies (%). Comparisons between categorical variables were tested using contingency tables and calculating the Chi-square test and Kendall's tau test for ordinal data. The Spearman's correlation test evaluated associations and correlation coefficients between the clinical parameters. All reported p-values are from two-sided tests and compared to a significance level of 5%. Data were analysed using SPSS for Windows version. The current study differs from that of Kalatzi e*t al.* (2015) regarding the methodology used but is similar inthe variables examined.

On the need for information about diabetes, the study revealed that the principal information considered as the most important by the majority of them (61.4%) concerned "what is the proper diet for diabetes," which was associated with younger age ($p = 0.037$). The next most important item reported was "What are the complications of diabetes" (41.9% of participants), which was associated with younger age ($p < 0.001$), higher level of education ($p = 0.002$), and higher income ($p = 0.002$). Third in reported importance was "what is the right exercise for diabetes" (28.1% of participants), associated with younger age ($p < 0.001$), higher education ($p < 0.001$), higher income ($p = 0.001$), lower disease duration ($p = 0.005$), Type 1 DM ($p < 0.001$) and lower HbA1c levels ($p = 0.010$). Furthermore, fourth in reported importance was

"the measures taken to avoid foot complications in DM" (24.1% of participants). This was increasingly important to patients who were being followed up in the Diabetic Foot Outpatient Clinic ($p < 0.001$) as well as to patients with a longer duration of DM ($p = 0.003$), those who resided in an urban area ($p = 0.010$), who had more visits to the clinic during the previous semester ($p = 0.003$) and who had a worse DM control ($p = 0.014$). The "symptoms of hypoglycemia" were ranked fifth in reported importance as a motivator to seek information for DM (21.7% of participants). People with Type 1 DM ($p < 0.001$), of younger age ($p < 0.001$), those followed in the Diabetes outpatient Clinic ($p < 0.001$), females ($p = 0.011$), with higher education ($p < 0.001$), shorter duration of the disease ($p = 0.028$) and a better DM control ($p < 0.001$) were more concerned about this variable. Interestingly, people with a longer duration of DM considered their knowledge and information about the disease quite satisfactory and reported they did not seek any more information about diabetes ($p < 0.001$). The reviewed study is related to the current study in terms of the population studied but different in context.

Forde *et al.* (2021) examined the impact of the COVID-19 pandemic on people with diabetes and diabetes services: a pan-European survey of diabetes specialist nurses undertaken by the Foundation of European Nurses in diabetes survey Consortium. The study aimed to describe diabetes nurses' perspectives on the impact of the COVID-19 pandemic on people with diabetes and diabetes services across Europe. Survey responses from 1829 diabetes nurseswere included in the analysis. The responses indicated that 28% (n = 504) and 48% (n = 873) of diabetes nurses felt the COVID-19 pandemic had impacted 'a lot' on the physical and psychological risks of people with diabetes, respectively. The following clinical problems were identified as having increased an 'a lot': anxiety 82% (n = 1486); diabetes distress 65% (n = 1189); depression 49% (n = 893); acute hyperglycemia 39% (n = 710) and foot

complications 18% (n = 323). Forty-seven percent (n = 771) of respondents identified that the level of care provided to people with diabetes had declined either extremely or quite severely. Self-management support, diabetes education, and psychological support were rated by diabetes nurse respondents as having declined extremely or quite severely during the COVID- 19 pandemic by 31% (n = 499), 63% (n = 1,027), and 34% (n = 551), respectively. However, this could be because most of the people living with diabetes rely on the nurses for health information on how to manage their diseases. The reviewed and current studies examined the same variables but are different in geographical location.

Analysis of Mengiste et al. (2021) research on information needs revealed that the respondents sought both prevention- and treatment-related types of diabetes information. Other types of prevention- and treatment-related diabetes information looked for by patients with diabetes were diet 128 (94%), alcohol risk 32 (23%), smoking risk 15(11%), diabetic symptoms 85 (61%), self-care management 83(59%), medical treatment 61(44%) and physical exercise 8 (6%). The results of the supportive qualitative study revealed that most patients with diabetes sought diabetes information for self-care management and to obtain information about diet related to the disease. A diabetic patient with higher education said: I have sought diabetes information to save a life through self-management and to get information about diet related to diabetes. The reviewed study and the current both examined information needs but differ in research methodology and geographical location

Dastani *et al.* (2019) examined Health information-seeking behaviour among Gonabad University of Medical Sciences students. The study aimed to investigate the information-seeking behaviour of health and how to search for health information in students of Gonabad

University of Medical Sciences. A descriptive survey was used for the study, and its statistical society is composed of students of Gonabad University of Medical Sciences. Data werecollected using a questionnaire consisting of 23 questions, whose validity and reliability were confirmed in previous studies (30). The five point Likert scale was collected for each of the items (very low, low, medium, high, and very high with a score of 1 to 5) and was collected over the course of 6 months from September 2017 to April 2018. The data were then coded and analysed using appropriate tests in SPSS version 20 software. The following formula was used to get the sample size, and 384 people were selected as the sample size, with 430 samplesselected for probable loss.

The findings of this study about health information-seeking goals in students of Gonabad University of Medical Sciences showed that students were more direction notified of the type of sickness with a mean of 3.29 and treatment method with an average of 3.20 to seeking health information. The study also revealed that students of each faculty are seeking health information; more students of the School of Health informed them about the prevention of sickness with a mean of 3.13, and more nursing schools to know The sickness treatment method, with an average of 3.37, in the Faculty of medicine and paramedicine, with an average of 3.51 and 3.15, is seeking health information seeking information on the sickness. The results of Friedman's test showed a significant difference between the use of different sources of health information seeking among students ($P < 0.05$), and internet resources and doctors have the highest number of referrals among students. The reviewed study and the current study are similar in the variables examined but have variances in population and method of data analysis.

Kalankesh *et al.* (2019) examined health information seeking behaviour among the University students. The main objective of this research is to determine the HISB among students of Tabriz University of Medical Sciences (TUOMS). The research is a descriptive, analytical and cross-sectional study conducted in 2017 in Tabriz University of Medical Sciences. The research community included all the undergraduate and postgraduate students. The total number of the study population was determined based on the statistics obtained from the educational deputy of Tabriz University of Medical Sciences in different schools. The study's sample size was computed using the following Cochran formula, and the sample size obtained for the study was 350. A researcher-made questionnaire was used to collect the data. The questionnaire included demographic variables such as age, gender, educational level, field of study, faculty and having digital devices, and variables such as search skills, health information search reasons, information retrieval sources, information search tools, type of health information, health information content, barriers and search benefits and search results. The questionnaire comprises 24 questions (5-point Likert scale) in 12 aspects and some yes-no questions.

Among the facilities and equipment used to search for health information, cell phones (89.%) and personal computers (59.3%) were the most used devices for health information search among students. Almost half of the students (49%) use Farsi, 16.3% use English, and 33.9% use both English and Farsi to search for their health information. The most informational content of students was textual (83.9%), followed by imagery (57.4%), video (51.2%), and audio (16%). Among the tools and equipment used to seek health information, students mostlyused cell phones and computers (including PCs and Laptops). This reflects university students'high penetration of information technologies, particularly cell phones. The study by Ajuwon (2013) showed that, in general, only 42.6 percent of students could use computers, and more

than half of medical students (58%) have computer literacy. Also, the study done by Boruff (2014) entitled "Mobile devices in Medicine: A Survey of how medical students, residents, and faculty use smartphones and other mobile devices to find information", showed that medical students use cellphones to search for information about narcotic drugs, doing clinical calculations and taking notes. However, a significant proportion of participants in this study used cellphones to search journal articles. The present study also revealed that, among students of Tabriz University of Medical Sciences, cellphones and computers are used more than other tools to search for health information.

Silvanus *et al.* (2022) examine factors influencing health-seeking behaviour among persons with diabetes attending urban healthcare settings. A cross-sectional study was conducted attwo private healthcare settings with a pretested semi-structured questionnaire to assess health behaviour, particularly gender and regular diabetes follow-up. Bivariate analysis and univariate and multivariate logistic regression were used to assess factors influencing HSB ($P<0.05$). Adjusted odds were reported within 95% confidence intervals.

Diabetes information seeking behaviour was reported by over three-fourths (84.4%). Three-fourths of the PWDs (75.1%, 95% CL: 70.0 to 79.0%) reported regularly visiting a health clinic for diabetes follow-up care. No gender difference was seen in health-seeking behaviours(Figure 2). About two-thirds (67%) had visited a health clinic about three months ago, and about one-fifth had visited six months ago. About 95% had visited a health clinic in the lastone year. Age categories ($P=0.013$), educational status ($P=0.02$), family income ($P= 0.004$), smoking status($P=0.001$), and family history of diabetes ($P= 0.001$) were found to be

significantly associated with appropriate health care seeking-behaviour (regular follow-up) among persons with diabetes.

However, Silvanus et al. (2022) concluded that diabetes information-seeking is a well-documented behaviour, and diabetes-related knowledge is known to improve after diagnosis. People living with diabetes (PWDs) in the study area often consult family members, friends, and healthcare professionals for information related to diabetes care and support. Younger people and those with higher education seek information online more often. However, most PWDs continue to perceive physicians as an important source of information regarding diabetes-related complications and therapy. Both studies examined information seeking but are both carried out in different geographical location.

Inche *et al.* (2014) examined the prevalence and determinants of appropriate health-seeking behaviour among known diabetics: results from a community-based survey. This study aimed to describe the current health-seeking behavior pattern and its determinants among rural communities. A community-based, cross- sectional study of disease events and experiences from diagnosis to the time of study was conducted among 460 known diabetics in the Tanjong Karang district.

The study revealed the adjusted odds ratio for the likelihood of appropriate health-seeking behaviour. When all predictive variables from the Bivariate analysis were entered in the multivariate analysis, absence of comorbidity (OR 3.15, 95% CI 1.66–5.98), seeking treatment within 24 hours of diagnosis (OR 2.62, 95% CI 1.35–5.07), duration of illness less than 5 years (OR 3.40, 95%CI 1.69–6.08) and those having high family support (OR 2.56, 95%CI 1.25–7.69) were determinants for appropriate health seeking behaviour.

Multivariate logistic regression analysis revealed that appropriate health seeking behaviour was significantly associated with age of the respondent, presence of comorbidity, familyhistory of diabetes, distance from health facilities, perceived family support, and history of early treatment-seeking at diagnosis and duration of disease. Inche *et al.* (2014) concluded thatthe studied population has better appropriate health-seeking behaviour and provision of knowledge with strong family support in diabetic care, which are important in controlling and preventing diabetic complications that need to be emphasized.

Mengiste *et al.* (2021) on the frequency of information seeking, revealed that about 36.3% of the patients with diabetes sought diabetes- related information monthly. However, only 1.7% of them, especially males and highly educated patients with diabetes, sought diabetes-related information every day. From the total group of respondents, three-quarters (75.6%) had sought diabetes information for "themselves" and 23.8% respondents for "both themselves and someone else"

This study found that only 1.7% of patients with diabetes, especially those with a higher level of education, sought diabetes information every day. This finding is similar to a study conducted by Kalantzi *et al.* (2015). in Athens, Greece in 2015, in which only 3% of patients with diabetes sought health information every day. Similarly, a study conducted in Saudi Arabia in 2017 found that only 4.1% of patients with diabetes sought health information every day for the management of their diabetes. Qusaier *et al.* (2017) observed that diabetesinformation was sought monthly by 36.3% of patients with diabetes.

Iorver (2020) assessed the utilisation of health information resources by diabetic patients in Benue State, Nigeria. The objectives of the study were to investigate the types of health

information resources, find out the sources of accessing health information, the health information resources utilized, investigate the extent of utilisation of health information resources, and determine the challenges of utilisation of health information resources bydiabetic patients in Benue state. The study adopted a descriptive research design. The population of the study comprised all the one thousand six hundred and ninety-eight (1,698) registered diabetic patients in 2017 and 2018 as at the time of the research at Federal Medical Center, (FMC) Makurdi, Benue state University Teaching Hospital (BSUTH), General Hospital Katsina-Ala and General Hospital Otukpo, which represents the three zones in Benue state. A sample size of 324 registered diabetic patients in the hospitals under study was drawn from the study population using Taro Yamen formula for sample size determination. A proportionate stratified random sampling technique was used to stratify the sample size of 324 diabetic patients into four strata based on population: FCM has 130, BSUTH has 97, General Hospital Katsina-Ala has 65, and General Hospital Otukpo has 32. A self-designed instrument was used as an instrument for data collection. Three hundred and twenty-four (324) copies of structured questionnaire were administered by the researcher and four (4) research assistants. The data collected was analyzed using descriptive statistics.

On the extent of utilisation of health information resources by diabetic patients in Benue State. The study revealed that some items listed for the study are highly utilized such as: Treatment fact sheet ($\overline{X}$=2.61, SD = 0.80), Medical posters ($\overline{X}$=2.60, SD = 0.63), Medical billboards ($\overline{X}$=2.59, SD = 0.64), Medical pamphlets ($\overline{X}$=2.61, SD = 0.80), Medical videos ($\overline{X}$=2.65, SD = 0.70). While, Medical books, Medical journals, Medical newspapers, Medical magazines, Medical brochures, Medical newsletters, Medical tapes, Medical cassettes, Medicus, Medical firms, Medical microform, Clinical Trails.gov, and Medical dictionaries all have a mean score

lower than 2.50 benchmark mean on a 4 point Likert scale. It can be deduced from this finding that the extent to which diabetic patients utilize health information resources in Benue State is low. Iorver (2020) revealed that the sources of accessing health information by diabeticpatients in Benue state are medical practitioners, nurses, other health workers, Television programmes and Radio programmes with percentage values of Yes above 50% were considered the sources of accessing health information by diabetic patients. The study of Iorve(2020) and the current study are similar in that they both examined health information seeking behaviour. However they have different population and geographical location.

In a cross-sectional study, Eke *et al.* (2022) examined the disparity and factors associated with internet health information seeking among adults living with diabetes mellitus. This study examines the factors associated with internet health information seeking among US adults living with diabetes and whether there is a disparity in internet health information seeking stratified by race and ethnicity. The cross-sectional study used the Health Information National Trends Survey data from 2017 to 2020. The study sample was based on respondents' reportson whether they were told they had diabetes, and our primary outcome was internet health information–seeking behaviour. The study used 2 multivariable logistic regression models to examine the effects of socio-demographic factors and other covariates on the internet health information–seeking behaviour of adults with diabetes. Jackknife replicate weights were used to provide bias-corrected variance estimates.

The study sample included 2903 adults who self-reported that they had diabetes. In total, 60.08% (1744/2903) were non-Hispanic White individuals, 46.88% (1336/2850) were men, and 64% (1812/2831) had some college or graduate education. The prevalence of internet

health information seeking in this population was 64.49% (1872/2903). The main factors associated with internet health information seeking included education level (some college vs less than high school: odds ratio (OR) 1.42, 95% CI 1.44-1.88; and college graduate or higher vs less than high school: OR 2.50, 95% CI 1.79-3.50), age (age group ≥65 years vs age group 18-44 years: OR 0.46, 95% CI 0.34-0.63), and household income level (*P*<.001). In addition, we found significant differences in the effects of predictors stratified by race.

The current study and that of Eke *et al.* (2022) are similar in that both studies examined the utilisation of health information, the same population, and the use of a regression model. However, they are different in times of geographical location. The current study was conducted in North Central Nigeria, while the review was conducted in the United States of America. Also, the current study used primary data while the reviewed study used secondary data.

Zare-Farashbandi *et al.* (2017) examined the effect of the patient-physician relationship on health information-seeking behaviour of diabetic patients. The study aimed to determine the effect of patient-doctor communication on information-seeking behaviours of diabetic patients. This descriptive-analytic study was done on 362 diabetic patients receiving care in governmental medical centers supervised by the Deputy of Health in Isfahan province, Iran, who were selected using disproportionate stratified random sampling. The data gathering tool was the Lango questionnaire, which was localized to Iranian society by researchers in 2012. Data were analysed using SPSS 20 software. Patients' verbal consent were obtained, and they were assured about the information's confidentiality. There was a significant difference between the information-seeking behaviour of people who depend on their physicians to gain

information and those who do not in terms of information retrieval (P=0.003). There was also a significant relationship between consulting the physician and three of the four dimensions of information seeking behaviour of diabetic patients and also between the transfer of medical information to the patient and dimension of information sources in patient information-seeking behaviour (P<0.05). Investigating the relationship between satisfaction with the transfer of medical information and information seeking behaviour indicated that the only significant difference between satisfied and dissatisfied patients is in the component of gaining information from traditional media (P<0.05). The current study is similar to that of Zare- Farashbandi *et al.* (2017) in that both examined diabetic patients and used the same research methodology. They, however differ in terms of geographical location.

The article titled "stress, quality of life, and health seeking behaviour among Type 2 Diabetes Mellitus Patients in Wangon, Banyumas, Indonesia" by Rizqillah *et al.* (2020) aimed to investigate the relationship between stress, quality of life, and health-seeking behaviour among type 2 diabetes mellitus patients in Wangon, Banyumas, Indonesia. The study involved 85 participants who were recruited using a purposive sampling technique. The study utilized socio-demographic, diabetes distress scale, WHO quality of life, and health-seeking behaviour questionnaires to collect data from the participants.

The study found a significant correlation between stress and quality of life among type 2 diabetes mellitus patients. The Spearman rank test reported a strong negative correlation (cc: - 0.559, p: 0.0001), indicating that lower stress levels may lead to higher quality of life. The study also found that stress among diabetes mellitus patients triggers physical and psychological mechanisms, such as hormonal systems, that lead to a decrease in quality of life.

Additionally, the longer duration of suffering from diabetes mellitus affects the lower level and quality of life.

However, the study found no association between stress and health-seeking behaviour among diabetes mellitus patients (cc: 0.087, p: 0.429). The bivariate test reported that socio-demographic factors were the most influential factors in health-seeking behaviour among diabetes mellitus patients. The study also found that more than half of the participants had a moderate level of quality of life (54.1%). The study attributed this finding to the long-term modification of healthy lifestyles required for diabetes mellitus treatment and management, which often makes patients feel hopeless with the treatment program.

Furthermore, the study found that most participants managed their health problems by visiting formal and non-formal healthcare facilities. Non-formal healthcare facilities refer to the independent practice of general practitioners, nurses, midwives, and herbal or traditional medicine, while formal healthcare facilities refer to hospital and public healthcare facilities. The findings of this study can inform healthcare providers and policymakers in developing interventions that address stress and improve the quality of life of diabetes mellitus patients. The study of Rizqillah *et al.* (2020) is similar to the current study in that both used the same population. However, the content scope of the studies differs in geographical location.

Mengiste *et al.* (2021) carried out a study on the diabetes information-seeking behaviour and its associated factors among patients with diabetes in Debre Markos referral hospital, Amhara region, Northwest Ethiopia was, aimed to assess the diabetes information-seeking behaviour and its associated factors among patients with diabetes in Debre Markos Referral Hospital, Amhara Region, Northwest Ethiopia. The study also found that having higher educational

status, urban residence, comorbidity, and adequate health literacy level increased the likelihood of diabetes information-seeking behaviour among patients with diabetes. The logistic regression model showed that educational status, place of residence, comorbidity, and health literacy were significantly associated with diabetes information seeking. The current study and the reviewed study are similar in that both examined the information seekingbehaviour of diabetic patients but were different in terms of geographical location.

Jamal *et al.* (2015) examined the association of online health information–seeking behaviour and self-care activities among type 2 diabetic patients in Saudi Arabia. The study aimed to identify the socio-economic determinants that affect the health information seeking behaviour of diabetic patients. The study used a cross-sectional design and recruited 344 patients with diabetes from a tertiary care hospital in Saudi Arabia. The patients completed a self-administered questionnaire that collected information on their socio-demographic characteristics, diabetes-related factors, and health information seeking behaviour. The data were analysed using logistic regression to identify the factors associated with health information-seeking behaviour.

Among the 344 patients, 74.1% (255/344) were male, with a mean age of 53.5 (SD 13.8) years. Only 39.0% (134/344) were Internet users; 71.6% (96/134) used the Internet to seek health-related information. Most participants reported that their primary source of health- related information was their physician (216/344, 62.8%) followed by television viewers(155/344, 45.1%), family (113/344, 32.8%), newspapers (100/344, 29.1%), and the Internet (96/344, 27.9%). The primary topics participants searched for were therapeutic diet for diabetes (55/96, 57%) and symptoms of diabetes (52/96, 54%), followed by diabetes treatment

(50/96, 52%). A long history of diabetes, familiar history of the disease, unemployment, and not seeking diabetes education were the most common barriers to online health-related information–seeking behaviour. Younger age, female, marital status, higher education, higher income, and longer Internet usage duration were associated with more online health-related information–seeking behaviours. Most (89/96, 93%) online health-related information seekers reported positive behavioural changes after seeking online health information. The overall odds ratio (OR 1.56, 95% CI 0.63-3.28) for all self-care responses demonstrated no statistically significant difference between those seeking health-related information online and non-health-related information seekers. However, health-related information seekers were better at testing their blood glucose regularly, taking proper action for hyperglycemia, and adopting nonpharmacological management. The current study and the reviewed study byJamal *et al.* (2015) are similar in that both examined the information-seeking behaviour of diabetic patients but were different in terms of geographical location.

Sokey *et al.* (2018) examined media use for health information dissemination to rural communities by the Ghana Health Service. The study investigated the patterns and challenges of media use for disseminating health information to rural communities by the Ghana Health Service (GHS), focusing on the Shai Osudoku district of the Greater Accra Region, as a case study. The specific objectives of the study were: to identify the media by which the Ghana Health Service delivered health information and the media used by community members to access health information in the district; to investigate the benefits of using media and emerging technologies to disseminate and access health information and to find out the challenges encountered in providing and accessing health information using media.

This study employed the case study approach. The study's target population was people living in the Shai Osudoku district who came to Dodowa Hospital and community members of five of the twenty-four health CHPS zones. According to the statistical services report of 2014, the district's total population stood at 55,741. The study employed a questionnaire as its main instrument for data collection, complemented by information obtained through interviews of two directors of the GHS and four community health workers. Convenient and purposive sampling techniques were used to sample 210 community members within Shai Osudoku district for the questionnaire survey. Descriptive analyses were used to examine the quantitative data, while qualitative thematic content analysis was used for the interview data collected from the GHS staff.

The study revealed that respondents, when asked in which mode/medium they would prefer the health information. Four out of every five (80.8%) preferred it in video format, while just slightly above half (53.8%) preferred cell phone voice and text communication. Only a third (33.2%) preferred books as a format for putting information across, while 20.2%, 22.6%, 47.1%, 31.3%, 22.6% of them preferred pamphlets, magazines, audio cassette, newspapers andcomputer CDs, respectively. These findings indicate that respondents preferred electronic to traditional media for getting health information. The current study and Sokey *et al.* (2018) are similar in content scope and population. However, they differ because both studies were carried out in different geographical areas and have different research designs.

Petersen *et al.* (2019) investigated the challenges of adopting information communication technology for diabetes self-management In South Africa. The research was based on the extended Technology Acceptance Model and four factors (educational, technological,

economic, and socio-cultural). Shreds of evidence were gathered from a sample of 131 diabetic patients using semi-structured interviews.

The economic barrier was directly related to the cost of obtaining devices capable of supporting mobile health (m-health) applications or features and the cost of establishing an internet connection to manage their conditions. The educational barrier was related to the lack of participant awareness concerning the benefits of m-health applications. The socio-cultural barrier includes participant perceptions that mobile technologies will be useless, the mistrust of technology as a foreign concept, and the preference for face-to-face interaction with medical staff. The technological barrier pertains to the access and usage of technological devices and the availability of an internet connection. The study found that most participants were over 50, using a glucose meter, and had a low use rate for m-health applications. The younger age groups indicated cell phones and mobile applications as the method of choice for self-management activities. The economic barriers identified in this study may be challenging to overcome, given the country's overall low level of economic growth.

Despite the barriers, the study found that there were diabetic patients who exhibited positive perceptions of the usefulness of ICT for diabetes self-management activities. Therefore, it augers well for future interventions at the primary healthcare level. To promote the use of ICT, such as m-health, for self-management of diabetes, education and training must be incorporated. The outcome of such interventions will ensure that m-health becomes an integrated part of diabetic patients' daily routine to self-manage the condition.

Overall, the study highlights the challenges faced by diabetic patients in low-resource communities in South Africa and provides insight into potential solutions to mitigate these challenges. The findings of this study may be transferable to other provinces with similar economic, educational, and sociocultural contexts, such as Gauteng. The current study is similar to the study of Petersen *et al.* (2019) in that both have the same dependent variable andthe same population of the study. They are different in the research design and the instrument used for data collection.

Kalantzi *et al.* (2015) also investigated the obstacles to information seeking. The participants reported that important obstacles to information seeking were "lack of time" (33.5% of participants) and "cost" (31.5%), especially in younger patients <40 years old (78.3% and 65.2%, respectively), and those with higher education level and lower duration of the disease. Moreover, younger patients with Type 1 DM and those with higher education and higher income indicated that a large volume of unorganized information was a significant barrier to obtaining useful information. Patients residing in rural areas indicated more frequently that lack of competent infrastructures (78.4%) and lack of health care providers (81.1%) were obstacles to information, indicating a deficiency in structures and staff to sufficiently cover theinformation needs of diabetic patients in these areas. The reviewed and current studies are similar in content scope and research design but differ in geographical locations.

During the survey, Kalankesh *et al.* (2019) asked students to rate their skills related to health information-seeking behaviour. The average self-assessment score for computer skills was higher than moderate (76.8 %). When the students were asked about their skills in accessing health information using the Internet, using health databases, and searching healthinformation, the average scores were 3.75, 3.23, and 3.39, respectively.

An average score of 3.39 was obtained in seeking health information (82%). The highest score for the benefits of Internet searching compared with other methods was obtained for easier access to health information (4.16), and the lowest score was achieved for the availability of additional links (3.82). In response to the question on the type of information searched by students, it was revealed that more than 75% of students had the experience of searching information for healthy nutrition (78.2%), and physical activity and physical health (71.8%), medical prescription side effects (65.2%), drug instructions (63.4%), instructions for medication use (60.2%), and therapy-treatment risks and complications (60%). The lowest amount of searched health information by the students was related to drug addiction and its treatment (22.8%) and traditional medicine (30.2%).

Alkhatlan *et al.* (2018) examined the factors affecting seeking health-related informationonline among Kuwait's patients. This study aims to determine the proportion of patients who obtain health-related information through the internet and factors that could affect using the internet for seeking health information. This study was conducted in six general hospitals in Kuwait. A cross-sectional study was adopted to determine the proportion of patients who obtain health-related information online. It was followed by a case-control study to determine factors associated with online health information searches. A questionnaire was used, which included data related to sociodemographic characteristics, clinical history, and computer experience. The final analysis included 220 participants.

Most participants (93.2%) mentioned using the Internet for one or more purposes. Only 129 participants (62.9%) used the Internet to obtain health-related information. All studied socio-demographic factors, except age, marital status and computer skills variables, significantly

affected online search for health information. After adjustment for confounding, only gender, nationality, level of education, and using computers at work were proved to be significant determinants of the outcome of interest. The study deduced that health literacy and increased health information technology use to support patient self-management.

Kim *et al.* (2020) investigated health literacy and outcomes of a community-based self-help intervention: a case of Korean Americans with type 2 diabetes. This study aimed to empirically examine the underlying mechanisms of health literacy's role in diabetes management among a group of Korean Americans with Type 2 diabetes mellitus.Data from a randomized clinical trial of a health literacy-focused Type 2 diabetes self- management intervention conducted during 2012–2016 in the Korean American community were collected at baseline and at 3, 6, 9, and 12 months. A total of 250 Korean Americans withType 2 diabetes participated (intervention, 120; control, 130). Participants were first- generation Koreans.

At baseline, participants' mean REALM score (minimum/maximum, 0–66) was 32.1(SE = 1.5), indicating a third to sixth-grade level of HL knowledge. The mean DM-REALM (minimum/maximum, 0–82) was 51.3 (SE = 1.7), 7.3 points above the scale's midpoint. Mean comprehension was 15.3 (SE = 0.6; range, 0–28), mean TOFHLA functional HL was 4.2 (SE = 0.2; minimum/maximum, 0–7), and mean NVS functional HL was 1.7 (SE = 0.1; minimum/maximum, 0–6). Overall, HL scores in these KA immigrants with T2DM were lower than those previously reported for non-Hispanic

The study has examined the role of health literacy in DM management among KAs with T2DM. This sample suffered from low health literacy, with education attainment and level of

acculturation as significant correlates. These findings are consistent with those of previous studies in which researchers have identified that people with low educational levels-including older adults and first-generation immigrants whose primary language is not English—are among the most vulnerable groups affected by low health literacy. Kim *et al. (2020) demonstrated in their study* that health literacy knowledge and skills can be changed within a relatively short time (12 weeks), with a continually improving trajectory as a result of intervention. Improved HL strongly predicted improved self-care skills, including self- efficacy, which ultimately improved primary outcomes by lowering A1C and improving QO. Kim *et al.* (2020) concluded that self-efficacy and self-care skills significantly mediate health literacy, glucose control, and quality of life. Education and acculturation were the mostsignificant correlates of health literacy.

Aminuddin *et al.* (2021) examined the effectiveness of smartphone-based self-management interventions on self-efficacy, self-care activities, health-related quality of life, and clinical outcomes in patients with type 2 diabetes: A systematic review and meta-analysis. The study aimed to review the evidence and determine the effectiveness of smartphone-based self-management interventions on self-efficacy, self-care activities, health-related quality of life, glycated hemoglobin, body mass index (BMI), and blood pressure (BP) levels of adults with type 2 diabetes mellitus.

A systematic search of five databases (PubMed, Embase, Cochrane, CINAHL and Scopus) was conducted. Studies published in English from January 2007 to January 2018 were considered. Only randomized controlled trials (RCTs) of smartphone-based self-management interventions for patients with type 2 diabetes mellitus that reported any of the study outcomeswere included. Two reviewers independently screened the studies, extracted data, and assessed

their quality. Meta-analyses were conducted for the different study outcomes. A total of 26 articles, consisting of 22 studies with 2645 participants, were included in the review. The results from a meta-analysis of the studies revealed that as compared to the control group, participants who received smartphone-based self-management intervention had better self- efficacy with large effect size of 0.98 (P< 0.001), self-care activities with an effect size of 0.90(P< 0.001), health-related quality of life with an effect size of 0.26 (p=0.01), and lower glycated hemoglobin (pooled MD=-0.55) The study also revealed that individuals with diabetes who had higher health information literacy skills had better self-care practices. The reviewed study is similar to the current study in population but different in data analysis and geographical location.

Askari-Majdabadi *et al.* (2019) examined the use of health information technology in patient care management: a mixed methods study in Iran. This study aimed to determine the use of health information technology in patient care management in a case study in Iran. This mixed-method study was conducted in 2018 at Kowsar Hospital in Semnan, Iran. Data gathered by an observational checklist and one questionnaire included two main parts: one demographic and another assessment of information technology use in the care management of inpatients. The researcher prepared the questionnaire, and its validity was verified. The data were organized and analysed in the form of a descriptive-analytic report. In data collection, 10 participants, including nurses, head nurses, physicians, radiology experts, and Information Technology (IT)managers were interviewed, and data analysed using Directed Content Analysis.

Concerning satisfaction derived from information technology, Nurses were satisfied with the computerized system and believed it could facilitate the affair. From the nurse's viewpoint, the most common use of Health Information Technology (HIT) was access (observation) of

patient's admission and discharge information (100%), providing medicine and equipment, and transfer of patients (92.3%). The least was retrieved evidence in the care process (0 %) and judgment and analysis of radiological diagnostic procedures (0%). The potential of electronic records is not still applicable.

Zhang *et al.* (2020) studied the self-care and health-information-seeking behaviours of diabetic patients in Singapore. The study aimed to explore evidence to determine the extent of and describe the nature of current Patient-Generated Health Data (PGHD integration into Electronic Health Records (EHRs). The study research design was based on the framework forscoping reviews described by Arksey and O'Malley and guidance from the Johanna Briggs Institute. Systematic scoping reviews can answer broad questions when evidence is deficient and may identify gaps in the research knowledge base. The retrieved articles were screened foreligibility by two researchers, and data from eligible articles were abstracted, coded, and analysed.

A total of 19 studies met the inclusion criteria after screening 9,463 abstracts. Most of the study designs were pilots, and all were published between 2013 and 2019. Types of PGHD were biometric and patient activity (57.9%), questionnaires and surveys (36.8%), and health history (5.3%). Diabetes was the most common patient condition (42.1%) for PGHD collection. Active integration (57.9%) was slightly more common than passive integration (31.6%). Also, the majority of the respondents indicated that they could figure out where to get diabetes-related information; the study further showed that individuals with diabetes with higher health information literacy skills had better knowledge and awareness of reliablesources of health information. The reviewed study and the current are similar in content scope but dissimilar in data analysis and geographical location

Ahmadinia *et al.* (2022) examined the health information-seeking behaviour duringexceptional times: A case study of Persian-speaking minorities in Finland. This study aims to address the health-related information-seeking behaviour of minorities, and in particular, Persian-speaking living in Finland, by comprehensively exploring their health information activities during the COVID-19 outbreak. The study used the Longo extended health information model and a qualitative approach to collect data about the opinions and perspectives of Persian-speaking individuals regarding the impact of individual and contextualfactors on shaping their health information-seeking behaviour during the first wave of the COVID-19 pandemic March–May 2021) in Finland. Data were gathered through semi- structured interviews conducted via online communication channels. The participants were recruited through convenience sampling, and three channels were utilised: the personal network of the lead researcher consisting of Iranian, Afghan, and Tajik individuals residing in Southwest Finland; announcements on the webpages and social media for Iranian and Afghan residents in Finland (these pages are a part of communication platforms for sharing or receiving information among the Persian/Dari speaking community's residents in Finland), and

3) using a snowball sampling strategy. Eighteen individuals meeting the inclusion criteria volunteered to join the study. The qualitative analysis was deductive, and coding and analysing the interview contents were based on the extended Longo health model.

Concerning the effect of information seeking on the health of the studied population, three participants mentioned that they had reached better health outcomes due to a deeper understanding of the elements that influence an individual's or family member's health quality. Some participants also mentioned information about taking essential vitamin tablets during the outbreak. For example, one participant used this information to improve his health: "*Recently,*

I started taking multivitamin tablets because I read about their health benefits on boosting an individual's immune system."

The participants in this study reported that they managed to boost their health-related information-seeking outcomes when they received reliable health-related information about improving their health. They also mentioned that they became aware of the factors influencing their individual or household level health when reliable health-related information was available in different languages, provided in appropriate formats, and received reliable information through reliable sources. These results support similar findings in previous studieson Persian-speaking individuals living abroad.

The study of Ahmadinia *et al.* (2022) on health information-seeking behaviour during exceptional times revealed that some participants explained that they were more satisfied with their health-related information-seeking activities when the Finnish national broadcasting agencies, including the YLE website and YLE TV, started to provide the latest health-related information in different languages including Kurdish and Dari (Persian) languages. Regarding the participants' enhanced satisfaction with health-related information, a participant said, "I read on YLE about sleep disorders during the coronavirus pandemic. I started tracking my sleep quality and hours. I can now manage to sleep regularly for about 8 hours per day. I can see that the YLE news made me think about my sleeping habits, and now I feel much better after getting enough sleep". The reviewed study is similar to the current study in terms of content but differs in analysis and geographical location.

Malinaki and Gardikiotis (2023) examined the role of emotions in online health information-seeking behaviour (OHISB): their relationship with health disparities, e-health literacy, and

gender. The study explored the impact of emotions (i.e., fear, terror, satisfaction, complacent) after an online search of health information regarding health decision-making, health disparities, and eHealth literacy. And also interested in examining any gender differences regarding online health information-seeking behaviour. A total of 2,699 individuals (N = 2699) (1,753 female, 933 male, and 13 who chose not to define their gender) aged 17–84 years old (M = 31.18, SD = 13.47) participated in an online survey in the summer of 2020. Participants resided in Greece and were recruited via the Internet through snowball sampling.

Preliminary analysis showed that positive emotions after the online search of health information were positively related to (a) frequency of Internet use for health information ($r = .35$, $p < .01$), (b) perceived Internet's advantages and disadvantages regarding its reliability ($r = .51$, $p < .01$), (c) changing decisions ($r = .46$, $p < .01$), (d) promoting self-efficacy ($r = .47$, $p < .01$), and (e) consulting others ($r = .38$, $p < .01$). Negative emotions after online search of health information were (a) negatively related with eHealth literacy ($r = -.27$, $p < .01$) and (b) positively related with perceived disparity ($r = .20$, $p < .01$).

Regarding positive and negative emotions experienced after online search of health information hierarchical regression analyses that followed showed that gender in both the first (Rnegative emotions2 = .06, Fnegative emotions(14, 2.684) = 12,575 $p < .001$, Rpositive emotions2 = .14, Fpositive emotions(14, 2.684) = 31,491 $p<0,001$) and the second step (Rnegative emotions2 = .08, Fnegative emotions(15, 2.683) = 16,954, $p < .001$, Rpositive emotions2 = .14, Fpositive emotions(15, 2.683) = 29,59, $p < .001$) were related to emotions.
The more often participants used the Internet for health information, the more positive emotions they experienced afterward. Furthermore, the more positive emotions they

experienced after an online search, the more they were willing to use the information gathered. Malinaki and Gardikiotis (2023) also found out that men who experience more positive emotions, in contrast with women who experience more negative emotions, after an online search of health information, suggest that men and not women are more available to use the collected information.

Wilding *et al*. (2022) investigated the information seeking, mental health and loneliness: Longitudinal analyses of adults in the UK COVID-19 mental health and wellbeing study. The present study focused on information seeking across the six waves of the study and whether it was related to symptoms of depression, anxiety, and well-being as mental health outcomes, together with loneliness. A non-probability sample of adults (18 years or older) was recruited from the UK to the UK COVID-19 Mental Health and Wellbeing study (UK COVID-19-MH), with a longitudinal study design. A quota sampling methodology was employed, with quotas based on age (18–24 years: 12%; 25–34: 17%; 35–44: 18%; 45–54: 18%; 55–64: 15%; ≥65: 20%), gender (women: 51%; men: 49%), socioeconomic grouping (SEG; assessed via The National Readership Survey social grade; AB:27%; C1: 28%; C2: 20%; DE: 25%, based on occupation, where A, B and C1 are higher and categories C2, D, E are lower) and region of the UK (12 regions). The panel has approximately 300,000 registered adult members; of those invited, 4,394 did not participate in the survey. The majority were screened out as a quota was full (n=3527), and the remainder dropped out (n=867). Participants provided written informed consent online. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. Information seeking was assessed using a single item (“How often do you actively seek out information on

COVID-19: Less than once a day; 1-5 times a day; 6-10 times a day; 11-20 times a day; 21-50 times a day; 50+times per day). Given the time urgency, this measure was devised by an expert panel of highly experienced researchers and is considered to have good face validity.

The results of the hierarchical linear models found that there were significant positive associations between COVID-related information-seeking and depression (β = .25, p = .001; adjusted, β = 0.25, p = .001) and anxiety (unadjusted, β = .22, p<.001; adjusted, β = .22, p < .001) and a negative association between COVID-related information seeking and wellbeing (unadjusted, β = -.26, p<.001; adjusted, β = -.26, p < .001) and a positive association with loneliness (unadjusted, β = .05, p=.026; adjusted, β = .05, p = .026). The results showed that higher levels of COVID-related information seeking were associated with higher levels of depression, anxiety, and loneliness and lower well-being across the six waves.

The results of the hierarchical Bernoulli models found that there were significant positive associations between COVID-related information-seeking and clinically meaningful levels of depression (unadjusted, Odds Ratio = 1.14, 95% CI 1.014,1.280; adjusted, Odds Ratio = 1.09, 95% CI 1.014,1.280), anxiety (unadjusted, Odds Ratio = 1.21, 95% CI 1.066,1.375; adjusted, Odds Ratio = 1.17, 95% CI 1.066,1.375) and wellbeing (unadjusted, Odds Ratio = 1.12, 95% CI 1.003,1.248; adjusted, Odds Ratio = 1.12, 95% CI 1.003,1.248). The association between COVID-related information-seeking and clinically meaningful levels of loneliness was not statistically significant. The reviewed study and the current study are similar in that they both considered information seeking behaviour but varies in population and geographical location.

Firoozeh *et al.* (2016) examined the effect of contextual factors on the health information–seeking behaviour of Isfahan diabetic patients. The study aims to investigate the effect of contextual factors on the health information-seeking behaviour of diabetic patients in the city of Isfahan. The contextual factors investigated in this study include time passed since diagnosis, type of diabetes, use of insulin, use of oral medicines, presence of other illnesses, and family history of diabetes. The research was an applied study using a survey method. The statistical population consisted of 6426 diabetic patients being treated in 10 health centers under the supervision of the Deputy of Health of Isfahan Province (including Amir Hamzeh, Shahid Rezaian, Hazrat Sajad, Khorasgan, Rehnan, Imam Ali, Ghaedi, Mola Sadra, Khdijeh Kobra, and Haj Abbas Mehrbod Ladan). The sample size was determined using stratified random sampling with a 95% confidence limit of 362 patients. The data-gathering tool was Longo *et al.* (2010) information-seeking behaviour questionnaire, which was localised for use in Iran. Based on the opinions of experts investigating the content validity of the questionnaire, a few irrelevant questions about Iranian culture were eliminated. These questions concerned the patients' language, race, and religious beliefs. The final questionnaire contained four dimensions and 85 questions. From these, 53 have a Likert spectrum, 25 questions with yes or no answers, and seven with multiple answers. The experts confirmed the validity of the questionnaire. Cronbach's alpha was calculated to be .798 for the dimension of behaviour, cognitive ability, and interpersonal communication, .748 for the dimension ofinformation sources (with three factors of acquiring information from people and traditional and novel media), .898 for the dimension of type of information recipe (an active and passive receipt of information), and .843 for the dimension of the effect of information on the patient (the effect of information on health and stress levels of the patients). Data gathering was

carried out by personal visits to health centers and distributing the questionnaires among the patients while assuring them about the confidentiality of the information. The data were analysed in descriptive (frequency distribution, average, and standard deviation) and analytical (Pearson and Spearman correlation tests and independent t-test).

The study showed the relationship between the type of diabetes and the information-seeking behaviour of the patients. One-way ANOVA test showed that the average scores of some of the information-seeking behaviour factors such as acquiring information from people ($P = .012$), acquiring information from novel media ($P = .009$), and effect of information according to the patient ($P = .027$) were significantly higher for patients with diabetes during pregnancy compared with prediabetes and diabetes. However, no meaningful relation was observed for other factors of information-seeking behaviour. Approximate Duncan's test showed that prediabetes and type 2 diabetes didn't meaningfully differ from one another when it comes to acquiring information from people. Still, the average score of this factor for patients with diabetes during pregnancy was significantly higher than the other two types ($P < .05$). Approximate Duncan's test also showed that there was no meaningful difference between information-seeking behaviour of prediabetic and type 2 diabetic patients but that the average information-seeking score for patients with diabetes during pregnancy was significantly higher than the other two ($P < .05$). This test also showed no significant difference between type 2 and prediabetes when it comes to the effect of the information according to the patients. There was also no meaningful difference between prediabetes and diabetes during pregnancy, but there was a significant difference between type 2 and diabetes during pregnancy ($P < .05$).

Also, the study shows the relationship between using insulin and information-seeking behaviour of diabetic patients. Independent t-test showed no meaningful difference between

the average scores of patients using insulin and patients not using insulin (P > .05). The results also showed a meaningful difference in some of the factors of information-seeking behaviour, such as active information receipt and interpersonal relations between people with and without a family history of diabetes. Still, no difference existed between other factors for the two groups. The reason behind the differences is probably that patients with a family history of diabetes have previously witnessed the late complications of the disease and are more familiar with diabetes and its complications. Therefore, they are more willing to seek information to prevent or control the complications caused by diabetes. The study reviewed and the current stud are similar in that both examined information seeking but different populations wereused, including data analysis.

Das *et al.* (2022) examined the health literacy in a community with low levels of education: findings from Chakaria, a rural area of Bangladesh. Some of its objectives were to determine the knowledge of existing health facilities among respondents, preferred health information providers, and sources of information regarding immunization, diabetes, and hypertension consulted. The data for this study came from a cross-sectional survey carried out in September 2014 in Chakaria, a rural area in Bangladesh. One thousand five hundred respondents were randomly selected from the population of 80,000 living in the Chakaria study area of ICDDRB (International Centre for Diarrhoeal Disease Research, Bangladesh). HL was assessed regarding knowledge of existing health facilities and sources of information on health care, immunization, diabetes, and hypertension. Descriptive and cross-tabular analyses were carried out.

Das *et al.* (2022) on the management of diabetes revealed that in total, 44.4% (300 out of 676) of females and 36.6% (198 out of 541) of males knew about control measures for diabetes

($p<0.001$). Among them, 73.1% of respondents mentioned a low-carbohydrate diet, physical activity or exercise, drugs, lowering anxiety, low-fat food, and avoiding sweetened foods as measures to control diabetes, with similar levels of knowledge among males and females. Also, 24.2% (131 out of 541) of males and 31.1% (210 out of 676) of females knew about measures to control hypertension ($p<0.001$). Among them, 79.4% of respondents mentioned drugs, physical exercise, anxiety reduction, reduced salt consumption, and nutritious food as methods for controlling hypertension. A slightly higher percentage of males (82.1%) than females (77.8%) mentioned these measures for controlling hypertension.

Kyriacou and Sherratt (2019) examined Online health information–seeking behaviour by endocrinology patients. The study objectives were how and why the Internet is utilised for HRI, the frequency of such activity, its impact, future information needs, and the effect of language. A mainly quantitative, embedded mixed methods study was performed, employing a questionnaire survey. The research included 312 patients (78.4% response rate).

Online health information seeking (OHI) was reported by 175 patients (56.1%), especially in younger ($p = 0.037$) and more educated ($p = 0.006$) patients. OHI-seekers perceived OHI to be high-quality (135, 77.1%), but 104 (59.4%) were unaware of website certification tools.Among OHI-seekers, 63 (36.6%) reported positive behavioural changes after seeking OHI. Only 45 (25.7%) OHI-seekers discussed the information they gathered with their endocrinologist. If an interactive e-learning module was available, 194/312 (62.2%) patients expressed willingness to use it, especially those reporting a need for more HRI ($p = 0.024$). However, native speakers were more likely to report that OHI did not meet their information needs ($p < 0.001$).

Furthermore, Iorver (2020) identified some of the challenges affecting the utilisation of health information resource by patients with diabetes in Benue State as: Lack of health information resources ($\bar{X}$=3.24, SD = 0.87); Difficulties in understanding the available health information resources ($\bar{X}$ =3.05, SD = 0.98); Lack of applicability of health information resources ($\bar{X}$=3.22, SD = 0.86); Distance to health information sources ($\bar{X}$=3.24, SD = 0.93); Absence of diabetes data (=3.60, SD = 0.89); Absence of diabetes information network (=3.28, SD = 0.98); Ineffective communication strategies (=3.39, SD = 0.98); Poor health information literacy (=3.11, SD = 0.98); Lack of awareness of the existence of health information resources (=3.64, SD = 0.93); Poor Internet connectivity (=3.20, SD = 0.96); Absence of radio/television viewing programmes on diabetes in local languages (=3.36, SD = 0.98); Absence of medical and public libraries (=3.54, SD = 0.79); Slow adoption of Information Technology (=3.52, SD = 0.87); Lack of computer operation skills (=3.04, SD = 0.88) and Inaccessibility of health information resources (=3.11, SD = 0.63). The findings above clearly showed that patients living with diabetes in Benue State were constrained with a lot of difficulties when it came to the utilisation of health information resources. The study is similarwith the current study in that both studies focused on diabetes mellitus but differs in geographical location

Soroya *et al.* (2020) researched understanding information behaviour of diabetic patients: a case of the Diabetes Institute Pakistan. The study was designed to investigate the information behaviour of diabetic patients and to investigate the role of one institution that is working for diabetes management, treatment, education, and counseling in Pakistan, i.e., Diabetes Institute Pakistan (DIP). The “Embedded Design” based on the mixed methods research approach was adopted to carry out the current research. The study was mainly based on a quantitative

research design; quantitative data were collected through an adapted questionnaire, the supportive/supplementary qualitative data was collected through an in-depth interview with the medical director, observation record sheets and analysis of the available relevant documents i.e. prescription (prescription note pad with information), brochure and the website was applied.

Soroya *et al.* (2020) discovered that the obstacles faced by diabetic patients in Pakistan when seeking health information were faced with a lack of computer literacy as a significant barrier to accessing information, with a mean score of 2.18 and a standard deviation of 1.32. The great volume of online information was also identified as a challenge, with a mean score of 2.22 and a standard deviation of 1.49. Other barriers identified by the study include patients' low reading habits, prejudices, and trust in unreliable information available on the internet.The low literacy rate among patients and difficulty reaching patients from far away or rural areas were also significant obstacles.

The study also highlights the lack of health care providers, including doctors, clinical psychologists, nurse practitioners, and clinical social workers, as a major issue in accessing reliable information. The lack of infrastructure, such as computers and internet connectivity, was also identified as a barrier to accessing health information. The study concluded that doctors should actively participate in educating patients about available health sources and how to find reliable information from authentic websites. The study also recommended that health-related information should be produced and communicated in the native language using a patient-centered approach. The websites should provide information in dual languages with a focus on the native language, which may have an option of translation in dual languages.

Overall, the study provides valuable insights into the challenges and obstacles faced bydiabetic patients in Pakistan when seeking health information. The study's findings can beused to develop effective strategies to improve access to reliable health information fordiabetic patients in Pakistan. The reviewed study and the current study both examined information seeking behaviour of diabetic patient but differes in geographical location.

Kostagiolas *et al.* (2021) conducted a cross-sectional survey connecting health information-seeking behaviour with clinical data of type 2 diabetes mellitus patients in Athens, Greece. The purpose of this paper was on to investigate of type 2 diabetes patients' information- seeking behaviour in terms of their information needs, sources, and barriers faced by patients when seeking information. The study includes patients' information needs, information resources employed, obstacles encountered, clinical evidence, and socio-demographic variables. The survey was conducted by distributing a specially designed questionnaire at the outpatient Diabetes Clinic and the outpatient Diabetic Foot Clinic affiliated to the Medical School of Athens, University of Athens, at the "Laiko" General Hospital. The survey included 106 out of approximately 200 diabetic patients who visited the university clinics, with a response rate of around 53% during the study period.

The study found that the majority of the participants were males (62.3%), older than 60 years old (56.6%), married (73.6%), non-smokers (44.3%), occasionally exercising (47.2%) and having technical education (60.7%). The study also found that the main information needs of the patients were related to diabetes manifestation, diabetes medication, and diabetes pathogenesis. The study grouped the information sources into four components: written material, organized help/Internet, informal sources, and clinical sources. The study also

identified two main obstacles to diabetes-related information-seeking behaviour: information accessibility and information literacy.

The study used statistical analysis to assess the internal consistency of the questionnaire's construct, demographics, and clinical evidence. The study employed Exploratory Factor Analysis (EFA) to group the variables for each of the questionnaire's constructs. The study also reported correlation statistics among all grouped variables, demographics, and clinical evidence. Overall, the study highlights the challenges faced by patients with type 2 diabetes in seeking health information. The study found that patients face obstacles related to information accessibility and information literacy, which hinder their ability to manage their condition effectively. The study also found that patients rely heavily on clinical sources of information, indicating a physician-centered paradigm for diabetes-related information seeking. The study's findings suggest a need for more accessible and understandable health information resources for patients with type 2 diabetes. The reviewed and current study both focused on the health information-seeking behaviour of diabetic patients. However, they were in different locations.

Clara *et al.* (2021) conducted a study on self-efficacy as a predictor of self-management behaviour practice among people with type 2 diabetes mellitus in Indonesia. The study aimed to identify the predictors of diabetes self-management behaviour among patients with type 2 diabetes mellitus in Indonesia. The study used a cross-sectional design and collected data from 200 patients with type 2 diabetes mellitus who were selected using a purposive sampling technique. The study analysed the relationship between age, gender, education, socioeconomic status, knowledge, duration of diabetes, self-efficacy, and diabetes self-management behaviour.

The study found a significant relationship between self-efficacy, duration of diabetes, and knowledge of diabetes self-management behaviour. The results also showed no relationship between the confounding variables of age, gender, education, and socioeconomic status with diabetes self-management behaviour. The multiple linear regression analysis showed that self-efficacy was the only significant predictor of diabetes self-management behaviour after controlling for the confounding variables.

The study's findings suggest that self-efficacy is crucial in predicting diabetes self- management behaviour among patients with type 2 diabetes mellitus in Indonesia. The study's results are consistent with previous research showing a significant relationship between self- efficacy and diabetes self-management behaviour. The study's findings have important implications for nursing services, especially medical-surgical nursing, in providing education, support, and motivation for diabetes self-management to increase patients' self-efficacy. The study's results also provide input for educational institutions to add special material to the learning curriculum about educational strategies and strategies to increase self-efficacy for people with diabetes. The study's findings can inspire other researchers to research the factors that influence the increase in the self-efficacy of people with type 2 diabetes mellitus.

The study identified self-efficacy as the significant predictor of diabetes self-management behaviour among patients with type 2 diabetes mellitus in Indonesia. The study's findings have important implications for nursing services and educational institutions in providing education, support, and motivation for diabetes self-management to increase patients' self-efficacy. The study's results also provide input for future research on the factors that influence the increase in the self-efficacy of people with type 2 diabetes mellitus. The reviewed and current studies are similar in terms of variables examined but different in geographical locations.

Wahyuni *et al.* (2017) investigated the effect of diabetes self-management education on knowledge of control of blood sugar in diabetes mellitus patients. This study aims to prove the influence of diabetes self-management education on the knowledge of blood glucose control in people with diabetes mellitus in Gayaman Village and Kweden village work area health center Gayaman Mojokerto. In this research, the design used is a pre-experiment with a one-group Pre-post-test design approach. The population is all DM patients in Gayaman Village and Kweden Village, with 32 respondents. Samples from 32 respondents were taken using the totalsampling technique. Data collection techniques used questionnaires, and data were analysed using cross tabs. The study revealed an influence of diabetes self-management education (DSME) on knowledge about controlling blood sugar levels in people with diabetes mellitus, with a value 3.1%. Diabetes Self Management Education (DSME) can be an intervention in providing knowledge to patients with diabetes mellitus so that patients can control blood sugarlevels well. The reviewed and current studies are similar in terms of variables examined but different in geographical locations.

The article titled health care seeking behaviours in Type 2 diabetic patients in East Azerbaijan by Jalilian *et al.* (2020) aimed to investigate the health care seeking behaviours of patients with type 2 diabetes in East Azerbaijan, Iran, and its impact on the management of the disease.The study was conducted using a cross-sectional design, and the sample size included 1139 diabetic patients aged over 18 years who were referred to educational hospitals, endocrinologist offices, health centers, and clinics in Tabriz, Iran. The study used statistical analysis to assess the association between demographic, socio-economic, and disease-related

variables and health-seeking behaviours. The data were analysed using Statistical Package Social Science Version 22, and frequencies, percent, mean, and standard deviation was calculated for the variables. The chi-square test was used to assess the association between the variables.

The study found that most patients received information about managing their disease from their physician, which was considered positive behaviour. However, many of the patients also consulted family members and friends. The study also found that a small proportion of patients used electronic databases, blogs, websites, health portals, mobile applications, and social networks. Radio and TV programs and Diabetes Associations failed to play their crucial role in informing diabetic patients. The study concluded that health care-seeking behaviours of diabetic patients in East Azerbaijan were influenced by the patients' socioeconomic and structural environment.

The study found that 66.3% of the patients were women, and the mean age, disease duration, and BMI of patients were 56.93 ± 13.34 years, 9.06 ± 7.12 years, and 28.37 ± 5.27, respectively. The type of current treatment of most diabetic patients (54.3%) was oral agents. 30.2% of patients had a history of hospitalization due to complications of diabetes during the past year. 76.1% of patients had at least one comorbidity or complication. The study also reported that ethical approval was obtained from the Research Deputy of Tabriz University of Medical Sciences, Iran, and the Student Research Committee, Tabriz University of Medical Sciences, funded the study. The study acknowledged the educational hospitals, diabetes clinics, primary health care centers affiliated with Tabriz University of Medical Sciences, and private endocrinologist offices for collaborating with the authors to collect data.

The article titled patients' experiences of diabetes self-management education according to their health-literacy levels: a qualitative study by Kim *et al.* (2020) explored the influence of information-seeking on diabetes self-management among patients with different health literacy levels. The study is based on qualitative research and provides insights into the challenges and strategies of diabetes education, the depth and breadth of learning, and the application of knowledge in daily life. Participants were recruited from a university hospital located in the South Eastern region of South Korea. Purposive sampling was used, and the eligibility criteria were as follows: patients had participated in a formal diabetes self-management education programme in the past month at any healthcare institution, had been diagnosed with type 2 diabetes mellitus, and were aged 18 or over. The researcher initially approached participants in the hospital's endocrinology ambulatory unit and provided details about the study. Individuals who agreed to participate were asked for informed consent, and their health literacy level was assessed using the short version of the Korean Functional Health-Literacy Test, which has been tested for validity.

The study found that patients with limited health literacy had limited access to health information and were less likely to seek out new information or use online services to search for diabetes information. They also exhibited confusion about certain basic terms of diabetes management and held false beliefs about various folk remedies for which there is littleevidence of improving glucose management. In contrast, patients with adequate health literacyasked more confirmatory questions and had better skills in accessing health information. Regardless of health literacy levels, most patients reported enhanced motivation for managing their illness after completing a diabetes education program. However, they expressed frustration in applying the information they obtained during their diabetes education program

to their lives. Many patients perceived that the practical skills taught to them were insufficient for preparing meals or selecting foods based on nutritional information. Participants asked for food menus beneficial to diabetes management that they could use when preparing a meal rather than nutritional information because such information was often too difficult to interpretand apply.

The study has several implications for nursing research and practice. The findings suggest that diabetes education should adopt a hands-on, behavioural approach that matches patients'health literacy levels. Assistance in acquiring information, providing information through key points with a step-by-step approach, and effective communication are useful strategies when instructing patients with limited health literacy. A systematic, in-depth, and individualized approach is more effective in delivering diabetes education to patients with adequate health literacy.

The study also highlights the importance of healthcare providers being more involved in the communication process, such as using the teach-back method, to ensure patients understand diabetes education correctly. This is essential for ensuring that patients understand diabetes education correctly and can apply the information they learn daily. The study by Kim *et al.* (2020) provides valuable insights into patients' experiences with diabetes in self-management education based on their health literacy levels. The study highlights the importance of adopting a hands-on, behavioural approach that matches patients' health literacy levels and the need for effective communication strategies in diabetes education. Further research is neededto explore.

Olesen *et al.* (2017) conducted a cohort study among 1399 Danes on the association between higher health literacy and better glycemic control in adults with type 1 diabetes. The study aimed to determine if diabetes self-management is influenced by various factors, including the ability to access, understand, appraise, and use health information in everyday life, collectivelycalled health literacy. A cross-sectional study was conducted with 1399 people with type 1 diabetes attending a Danish specialist diabetes clinic. Health literacy was assessed using the nine-domain Health Literacy Questionnaire. The association between health literacy and HbA1c was analysed using linear regression with adjustment for age, sex, educational attainment, and diabetes duration. Results Of the 1399 participants, 50% were women, the mean age was 54 years, and the mean HbA1c was 61mmol/ mol (7.8%). Higher health literacyscores were associated with lower HbA1c levels across eight of nine health literacy domains. This association remained significant after adjusting for educational attainment. Among the domains, 'Actively managing my health' had the strongest impact on HbA1c. This waspredicted by 'Appraising health information', 'Having sufficient information to manage health,' and 'Social health support.'

The statistical findings from the reviewed studies support the notion that health information utilisation plays a crucial role in achieving better glycemic control in individuals with diabetes. The ability to read, understand, and critically appraise health information, navigate the healthcare system, and communicate with healthcare providers is an important skill for effective diabetes self-management. The statistically significant associations between health information utilisation and glycemic control suggest that interventions targeting these health literacy skills may improve diabetes management outcomes.

In conclusion, the empirical evidence from the study supports the influence of health information utilisation on better glycemic control in individuals with diabetes. The statistically significant associations between health information utilisation and glycemic control highlight the importance of health literacy skills in diabetes self-management.

Shaw and Johnson (2011) examined the health information seeking and social media use on the Internet among people with diabetes. The focus was on understanding the online health-seeking behaviours of individuals with diabetes and their willingness to use social media to discuss their health status and obtain health information. The study also aims to determine if online social media platforms are appropriate for reaching minority and rural populations. This study used a cross-sectional survey design with a convenience sample of people with diabetes (n=57) recruited from the sub-urban and rural South-eastern US between June and October 2009. Flyers were placed in primary care clinics and libraries across two counties. Participants were asked to complete an online web-based survey tool (SurveyMonkey.com LLC, Palo Alto, CA). Due to the web address URL length, a shortened URL was created through TinyURL.com and placed on the flyers and online classified ads.

The study found that 82.1% of participants sought information about diabetes online. The most commonly sought information included general information about diabetes (69.9%), treatment options (60.9%), ways to cope (54.3%), and nutrition (69.9%). Additionally, 28.3% of participants sought information about alternative or complementary therapies. Only 23.9% of participants reported obtaining diabetes information from journal articles.

Regarding online social media use, 19.6% of participants reported using chat rooms, discussion groups, or online support groups related to diabetes. Furthermore, 19.6% sought

financial assistance information online. The study also found that 75.4% of the sample were female, with nearly half identifying as White non-Hispanic. The findings highlight the high prevalence of seeking diabetes information online and the various types of information sought by individuals with diabetes. These findings suggest that individuals with diabetes actively sought health information online, which may have implications for their diabetes management.

These results suggest that a significant percentage of people with diabetes seek health information online and, in particular, information about diabetes. This was consistent with the literature that states that over 61% of American adults sought health information online. Most participants from this study frequent popular online social networking sites (i.e., Facebook, Myspace, etc.) and would be willing to discuss health information on these venues. Approximately half of the survey respondents were non-White, with no significant difference between races in searching for health information online, utilizing popular social networks, and being willing to discuss health information online. In addition, participants were recruited from rural and suburban locations in the southeastern US. This may indicate that these online venues could reach diverse and non-urban populations. These results complement findings thatpeople with diabetes use online resources and diabetes-specific online social networks such as DiabetesFriends.net, which has over 1,000 members, and TuDiabetes.org, which has over 16,000 members. Other online social networking sites include Dlife, DiabetesSisters, and DiabetesOC. A search on Facebook revealed over 500 existing diabetes-related groups, such as The Heart of Diabetes and Talk Diabetes.

The research "Relationship between Self-Care Behaviour and Diabetes Self-Management Education in Patients with Diabetes Mellitus Type 2" by Uly *et al.* (2022) explored the

relationship between self-care behaviour and diabetes self-management education (DSME) in patients with type 2 diabetes mellitus (DMT2). The study aims to determine the influence of health information utilisation on diabetes management. The method used in this study was a quantitative approach using cross-sectional methods. The sample used was 115 patients with type 2 DM in Palopo Regency. The study focuses on knowing the correlation between self- care behaviour and DSME for DM patients type 2 using a research instrument in the form of a questionnaire. This research questionnaire is divided into four parts; namely, the first part is demographic data, the second part is the diabetic management questionnaire to measure self-management using the diabetes self-management questionnaire, and the third part of the questionnaire about the self-care behaviour of DM patients type 2. The analysis test used is a linear regression test to determine the relationship between the variable self-care behaviour and the DSME variable for DM patients type 2 with a value and significance < 0.05, which is considered significant and looked at the structural model of research using the Structural Education Model with Amos 2.0 and SPPS version 20.

The research findings indicated that knowledge was a significant factor in forming self-care behaviour variables (p=0.0001). The study also revealed that controlling blood sugar significantly and strongly formed the DMSE variable (p=0.0001). These statistical findings highlight the importance of knowledge and blood sugar control in diabetes management. Furthermore, the study emphasizes the significance of self-care behaviour and DSME in managing diabetes. It suggests that self-care behaviour, including medication adherence, blood sugar control, diet, physical activity, and foot care, was crucial for effective diabetes management. DSME plays a vital role in improving knowledge and self-care behaviour among patients with DMT2. The research conducted by Uly *et al*. (2022) highlighted the importance

of health information utilisation, knowledge, and self-care behaviour in effectively managing type 2 diabetes mellitus. These findings have implications for healthcare professionals in educating and supporting patients with DMT2 to enhance their self-care practices and improve their overall diabetes management.

Ghweeba *et al.* (2021), in a cross-sectional study, examined how diabetes mellitus-related health information is received by Egyptian internet users. This study aimed to explain health information-seeking behaviour using internet health information among Egyptian adults with diabetes. Subjects and Methods: This cross-sectional study was conducted from June to October 2019. A Web-based questionnaire from a popular Arabic-language health informationwebsite was sent to Egyptian Internet users aged 18 years and older (N=380). The online questionnaire form included personal characteristics and preferences for using internet health information and explored the impact of obtained health information on users' health behaviour.

Two hundred eighty-three participants completed the Web-based questionnaire with a response rate of 74.5 % (283/380). Personal characteristics of the participants showed that 161 (56.8 %) participants were under 35 years old, 182 (64.3%) were female, and 110(38.8%) hada good general health status. Participants prefer seeking OHI for an existing health problem 138 (48.8%), while 106 (37.4%) participants seek OHI when having a new health problem. Internet health information helped 192 (67.9%) participants to improve their understanding of their health problem, 160 (56.7%) participants reported that they had decreased their unnecessary visits to their physicians, helped 179 (63.4%) participants to take an active role in

their diabetes health management, and 186 (65.9%) participants reported applying healthy changes in their lifestyle.

The study revealed that participants reported their reasons behind using the Internet as a source of health information related to DM. Of all the respondents, 219 (77.5%) participants agreed that the Internet was a cheap source of health information, 173 (61.2%) participants agreed that it was a convenient source of health information, and 144 (51.1%) participants agreed that anonymity of users was a reason for seeking OHI related to DM. The study further revealed that participants explained the impact of health information obtained from the Internet on their health behaviour. Of the responses, 192 (67.9%) participants explained that OHI had improved their understanding of the health problem they were searching for. Also, 160 (56.7%) participants reported that using the OHI has decreased the number of unnecessaryvisits to their physicians. Participants who reported that seeking OHI helped them to take an active part in the management of their health problems were 179 (63.4%) participants. Based on using the OHI, 186 (65.9%) participants reported applying healthy changes in their lifestyle, such as changing their diet and practicing physical exercise. There was a significant association between participants who use the Internet as the main source of health information and improving their understanding of the health problem they were looking for (p value=.012) and encouraged them to healthy lifestyle behaviour changes and changes in their diet or practice physical exercise (p value=0.006).

Bosch-Frigola *et al.* (2022) investigated the European national health plans and the monitoring of online searches for information on diabetes mellitus in different European healthcare systems. This study evaluated the impact of online health information-seeking

behaviour (OHISB) during World Diabetes Mellitus Day (WDMD) in European countries from 2014 to 2019 by grouping countries according to the changes in citizens' search behaviour, diabetes mellitus prevalence, the existence of National Health Plans (NHP), and their respective healthcare systems. The co-authors extracted data from the Global Burden of Disease, Google Trends (GT), Public Health European Commission, European Coalition for Diabetes, and the Spanish Ministry of Health. First, the researchers used the broken-line models to analyse significant changes in search trends (GT) in European Union member countries in the 30-day intervals before and after the WDMD (November 14) from 2014 to 2019. Then, the results obtained were used in the second phase to group these countries by factor analysis of mixed data (FAMD) using the prevalence of DM, the existence of NHP, and health models in each country. The calculations were processed using R software (gtrendsR, segmented, Factoextra, and FactoMineR). We established changes in search trends before and after WDMD, highlighting unevenness among European countries. However, significant changes were mostly observed among countries with NHP. These changes in search trends, were reiterated over time and occurred especially in countries belonging to the Beveridge Model (Portugal, Spain, and Sweden) and with HPs in place. Greater awareness of diabetes mellitus among the population and continuous improvements in NHP can improve the patient's quality of life, thus impacting disease management and healthcare expenditure.

The study revealed that health information seeking and utilisation is crucial in managing diabetes mellitus (DM). The research revealed that analysing user activity collected through platforms like Google and Google Trends (GT) could provide valuable insights into health information-seeking behaviour (OHISB). These platforms have been used to evaluate the positive impact of the management of DM in various European countries.

In a meta-analysis, Novianto *et al.* (2021) examined the effectiveness of health management-assisted technology on glycated hemoglobin levels in patients with type 2 diabetes mellitus. The study aimed to prove the effectiveness of technology-based health management compared to usual treatment for glycated hemoglobin (HbA1c) levels in type 2 diabetes mellitus patients.The research made use of a meta-analysis using a randomized controlled trial. Articles were obtained from PubMed, Google Scholar, and ResearchGate databases. The articles used in thisstudy were those published from 2012 to 2021. The search article was carried out by considering the eligibility of the criteria determined using the PICO model. Population: type 2 DM patients (HbA1c>7%), Intervention: health management-assisted technology, Comparison: usual care Outcome: HbA1c levels. Ten articles were used with a sample size of 1693 people who were divided into two groups (845 people in the health management assisted technology group and 848 people in the group usual care). Articles were analysed using Review Manager 5.3 Application to determine the study sample's Standard Mean Difference (SMD) and heterogeneity.

Findings from the study revealed that significant results were obtained from 10 articles processed using RevMan 5.3. This was indicated by the overall effect (diamond), which does not touch the vertical line H0 (d= 0) and can also be seen from the 95% CI range of -0.62 to -0.13, which shows significant because it does not pass the number 0 (SMD= -0.37; 95% CI= -0.62 to -0.13; p= 0.003). The heterogeneity of the research data shows I2 = 82%, so the data distribution is very heterogeneous (random effects model). Novianto *et al*. (2021) concluded that using technology to help the health management of patients with type 2 diabetes mellitus can reduce HbA1c levels compared to usual care. The reviewed and current studies are similar

as both examined information-seeking behaviour for the management of diabetic mellitus. Both studies are at variance in research methodology and graphical location.

2.4. Summary of Literature Review

The review of literatures are organised under four main headings: conceptual framework, theoretical framework with subheadings, the review of related empirical studies, and a summary of the literature reviewed. The literatures were reviewed under conceptual frameworks that discussed the concepts of diabetes, health information, information needs, information-seeking behaviours, and source of health information, among others. The theoretical framework featured three theories, including the information utilisation model by Lenz 1984, which acknowledged the stages of the health information utilisation process and sources that could help diabetic patients utilize health information effectively to manage their health condition. Extensive related empirical reviews were done, and it was discovered thatno work had been done on health information-seeking behaviour and utilisation for managing diabetes mellitus among patients in tertiary healthcare facilities in North Central Nigeria. This study, therefore, is expected to fill this gap.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

This study adopted a descriptive survey research design. Survey research was suitable for the study because, according to Oyedum *et al.* (2015), a survey assesses a situation to correct inadequacies or effect improvements. The survey research method was necessary for the study because data was collected and used to examine the health information-seeking behaviour and utilisation for the management of diabetes mellitus among patients in tertiary healthcarefacilities in North Central, Nigeria. The survey research method allows the selection of random samples from large and small populations to obtain empirical knowledge of a contemporary nature. According to Kumar (2018), a descriptive survey systematically describes a situation, problem, phenomenon, service, or programme or provides information about, say, the living condition of a community or describes the attitude towards an issue.

3.2 Population of the Study

The population of the study was 406 diabetic patients. The population was drawn from seven (7) tertiary healthcare facilities in North Central Nigeria. This was arrived at through the records of the Medical Out-Patient Department for type 2 diabetic patients at the tertiary healthcare facilities in North Central, Nigeria. These medical centers were chosen becausethey offer higher specialised care for diagnosis and treatment. The breakdown of the population of diabetic patients is shown in Table 3.1

3.1. Population of the Study

S/No	Tertiary Healthcare Facilities	Diabetic Patients
1	Federal Medical Centre Bida, Niger State	52
3	Federal Medical Centre Lokoja, Kogi State	50
4	Federal Medical Centre Makurdi, Benue State	57
5	Federal Medical Centre Keffi, Nasarawa State	45
6	Jos University Teaching Hospital, Plateau State	65
7	University of Abuja Teaching Hospital, FCT	75
8	University of Ilorin Teaching Hospital, Kwara State	62
	Total	**406**

3.3. Sample and Sampling Technique

The sample size was 406 diabetic patients. The researcher adopted the entire population for the study since the size was manageable. This process is called total enumeration or census. According to Kumar (2018), a researcher is at liberty to adopt the entire population of the study if it is of a manageable size for the study.

3.4 Instrument for Data Collection

The research instrument for data collection was the researcher's designed closed-ended questionnaire titled "Health Information Seeking Behaviour and Utilisation for the Management of Diabetes Mellitus Among Patients in Tertiary Healthcare Facilities in North Central, Nigeria (HISBUMDM). This was used to collect relevant data for the study. The questionnaire contained eleven (11) sections. Section A of the questionnaire elicited respondents' demographic information; Section B Sought Diabetic Patients' Source of Health Information; Section C dealt with Diabetic Patients' Health Information Needs; Section D was on Diabetic Patients' Health Information Seeking Behaviours, while Section E treated the frequency of Diabetic Patients Usage of Health Information for Diabetic Management. SectionF focussed on diabetic patients' information skills; Section G looked at diabetic patients' satisfaction with the use of information; Section H inquired about the emotional behaviour (Mental Health) of Diabetic Patients; Section I investigated the impact of health information- seeking behaviour, Section J asked for the socio-economic determinants of diabetic patients and Section K conclusively examined diabetic patients challenges encountered in the course ofseeking and using health information in tertiary healthcare facilities in North Central Nigeria.

3.5 Validation of the Instrument

The questionnaire went through face and content validation, judging each item on clarity and relevance. The questionnaire was validated by the researcher's supervisors and an expert in measurement and evaluation in Science Education Department of Federal University of Technology Minna, after which the identified corrections were embodied into the final version of the questionnaire.

3.6 Reliability of the Instrument

Reliability of the instruments was achieved by conducting a pre-test using forty (40) copies of the questionnaire in Federal Medical Centre Jabi, Abuja. The instrument was administered to diabetic patients during clinic days for diabetic and hypertensive patients (Tuesdays and Wednesdays). The respondents' responses were analysed using the Cronbach Alpha Reliability Coefficient formula. According to Tavakol and Dennick (2011), Cronbach's alpha was used to measure or assess the reliability, or internal consistency, of a set of scale or test items. The overall Cronbach reliability of the instruments yielded 0.73, which showed that the instrument was considered reliable and fit for the study. The result of this is attached as Appendix B.

3.7 Data Collection Procedure

A letter of introduction was collected from the head of the Department of Library and Information Science, Federal University of Technology, Minna, to the tertiary healthcare facilities studied. The letter was attached together with copies of the questionnaire to be administered. Ethical approvals were obtained from each facility's ethics review committee to be studied to ascertain the ethical soundness of the study. The instrument for the study was then administered and collected back by the researcher with the help of research assistants appointed from each of the healthcare facilities studied. The distribution and collection of the questionnaire took seven months to accomplish.

3.8 Method of Data Analysis

The statistical methods were used to analyse the data collected. Descriptive statistics such as frequency counts, percentages, and mean and standard deviations were used to measure the demographic characteristics of respondents and ten (10) research questions. The hypotheses were tested with the inferential statistics of; one way ANOVA and regression analysis in order

to establish the influence of independent variables on the dependent variable, while multiple regression analysis was used to predict the relative contribution of the independent variables (health information-seeking behaviour and health information utilisation) on the dependent variable (management of diabetes mellitus). Statistical Package for Social Sciences (SPSS) Version 23 was used for the analysis.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Response Rate

A total of four hundred and six (406) copies of the questionnaire were administered to diabetes patients in Federal Medical Centre Bida, Federal Medical Centre Makurdi, Federal Medical Centre, Lokoja, Federal Medical Centre Keffi, Jos University Teaching Hospital, University of Abuja and University of Ilorin Teaching Hospital during their Medical Out-PatientDepartment Schedules, out of which three hundred and thirty (330) copies of the questionnairewere filled, returned and found usable representing 81% response rate.

The breakdown of the response rate is shown below in Table 4.1

Table 4.1: Response Rate

S/No	Centres	No of Administered Questionnaire	No of Returned Questionnaire	Percentages (%)
1	Federal Medical Centre Bida, Niger State	52	38	9.4
2	Federal Medical Centre Makurdi, Benue State	57	42	10.3
3	Federal Medical Centre Keffi, Nasarawa State	45	35	8.6
4	Federal Medical Centre Lokoja, Kogi State	50	45	11.0
5	Jos University Teaching Hospital, Plateau State	65	54	13.3
6	University of Abuja Teaching Hospital, FCT	75	61	15.1
7	University of Ilorin Teaching Hospital, Kwara State	62	55	14.0
	Total	**406**	**330**	**81**

Table 4.1 showed that 38 (9.4%) copies of the questionnaire were retrieved from Federal Medical Centre Bida, 42 (10.3%) from Federal Medical Centre Makurdi, 35 (8.6%), from Federal Medical Centre Keffi, 45 (11.0%) from Federal Medical Centre Lokoja, 54(13.3%) from Jos University Teaching Hospital, 61(15.1%) from University of Abuja Teaching Hospital and 55(14%) from University of Ilorin Teaching Hospital. An aggregate response rateof 331 (82%) was obtained.

4.2 Demographic Distribution Respondents

The breakdown of the demographic variables of the respondents, such as gender, age group, occupation, level of education, and years of illness, are presented in Tables 4.2, 4.3, 4.4, 4.5, and 4.6

Table 4.2: Demographic Distribution According to Gender

S/N	Gender	Frequency	Percentages (%)
1	Male	197	60
2	Female	133	40
	Total	**330**	**100%**

Table 4.2 revealed that 197 (60%) of the respondents were males, while 133 (40%) were females.

Table 4.3: Demographic Distribution According to Age Group

S/N	Age Group	Frequency	Percentage (%)
1	5 – 15 Years	13	3.9
2	16 -25 Years	28	8.5
3	26 – 35 Years	49	14.8
4	36 – 45 Years	68	20.5
5	46 -55 Years	77	23.3
6	56 and Above	96	29
	Total	**330**	**100**

Table 4.3 indicates that the highest number of the respondents, 96 (29%), was 56 years and above, 77 (23.3%) were between the age group of 46 – 55 years, 68 (20.5%) were between the age group of 36 – 45 years, 49(14.8%) of the respondents were between the age group of 26 - 35 years, while 28(8.5%) and 13(3.9%) of the respondents were between the age group of 16 - 25 years and 5 -15 years respectively.

Table 4.4: Demographic Distribution According to Occupation

S/N	Occupation	Frequency	Percentage (%)
1	Students	21	7
2	Business Owners	75	23
3	Artisans	57	17
4	Civil Servants	122	37
5	Applicants	44	13
6	Health Professionals	11	3
	Total	**330**	**100**

Table 4.4 revealed that the highest number of the respondents were civil servants 122 (37%), followed by 75 (23%) that were business owners, 58 (18%) that were artisans, 44(13%) of the respondents were applicants, 21(7%) of the respondents were students and 11(3%) of the respondents were health professionals.

Table 4.5: Demographic Distribution According to Educational Level

S/N	Educational Level	Frequency	Percentage (%)
1	No Formal Education	17	5
2	Primary School	35	11
3	Secondary School	106	32
4	Tertiary	172	52
	Total	**330**	**100**

Table 4.5 revealed that 172(52%) of the respondents have a tertiary education, 106(32%) of the respondents have a secondary school education, 35(11%) of the respondents have a primary school certificate and 17(5%) of the respondents have no formal education.

Table 4.6: Demographic Distribution According to Years of Illness

S/N	Years of Illness	Frequency	Percentage (%)
1	Below 5 Years	55	17
2	6 – 15 Years	121	37
3	16 – 25 Years	73	22
4	25 Above	81	24
	Total	**330**	**100**

Table 4.6 revealed that 121(37%) of the respondents have been diabetic for between 6-15 years, 81(24%) of the respondents have been diabetic for more than 25 years, 73(22%) of the respondents have been diabetic for between 16 -25 years, and 55(17%) of the respondents have had diabetes for less than five years.

4.3 Presentation and Analysis of Results

4.3.1 : Research Question 1: What are the sources of health information used by diabetic Patients in tertiary healthcare facilities in North Central, Nigeria?

The respondents were asked to indicate the health information sources they use for the management of diabetes. Table 4.7 provides the following responses.

Table 4.7: Sources of Health Information Used by Diabetics Patients in North Central, Nigeria

S/N	ITEMS	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (45)		FMC KEF (35)		UITH (58)		JUTH (54)		UATH (61)	
		YES Freq (%)	NO Freq (%)	YES Freq (%)	NO Freq (%)	YES Freq (%)	NO Freq (%)	YES Freq (%)	NO Freq (%)	YES Freq (%)	NO Freq (%)	YES Freq (%)	NO Freq (%)	YES Freq (%)	NO Freq (%)
1.	Books	16(42)	22(58)	17(40)	25(60)	17(38)	28(62)	15(43)	20(57)	32(55)	26(45)	20(37)	34(63)	30(49)	31(51)
2.	Journal articles	13(34)	25(66)	13(31)	29(69)	19(42)	26(58)	18(51)	17(49)	24(41)	34(59)	15(28)	39(72)	25(41)	36(59)
3.	Booklets, brochures, leaflets etc., from clinic or health professionals	22(58)	16(42)	18(43)	24(57)	32(71)	13(29)	27(77)	8(23)	42(72)	16(28)	43(80)	11(20)	54(86)	7(14)
4.	Magazines/newspaper/ news magazine	20(53)	18(47)	20(48)	22(52)	25(56)	20(44)	22(63)	13(37)	49(84)	9(16)	39(72)	15(28)	50(82)	11(18)
5.	Internet	31(82)	7(18)	32(76)	10(24)	30(67)	15(33)	20(57)	15(43)	45(76)	13(24)	35(65)	19(35)	48(79)	13(18)
6.	WhatsApp groups	28(74)	10(26)	39(93)	3(7)	26(58)	19(42)	19(54)	16(46)	35(60)	23(40)	41(76)	13(24)	45(74)	16(26)
7.	Facebook pages/Facebook groups	26(68)	12(32)	16(38)	26(62)	30(67)	15(33)	23(66)	12(34)	38(66)	20(34)	34(63)	20(37)	51(84)	10(16)
8.	Blogs	11(29)	27(71)	11(26)	31(74)	19(42)	26(58)	11(31)	24(69)	24(41)	34(59)	23(43)	31(57)	34(56)	27(44)
9.	Twitter	7(18)	31(82)	11(26)	31(74)	13(29)	32(71)	8(23)	27(77)	25(43)	33(57)	22(41)	32(59)	24(39)	37(61)
10.	Instagram	13(34)	25(66)	15(36)	27(64)	16(36)	29(64)	16(46)	19(54)	18(31)	40(69)	23(43)	31(57)	30(49)	31(51)
11.	Health professionals	36(95)	2(5)	34(81)	8(19)	40(89)	5(11)	30(86)	5(14)	52(90)	6(10)	47(87)	7(13)	57(93)	4(7)
12.	Broadcast media (television, radio)	10(26)	28(74)	25(60)	17(40)	27(60)	18(40)	24(69)	11(31)	32(55)	26(45)	39(72)	15(28)	38(62)	23(28)
13.	Diabetic Patients' Associations	5(13)	33(87)	9(21)	33(79)	10(22)	36(78)	7(20)	28(80)	20(34)	38(66)	17(31)	37(69)	20(33)	41(67)
14.	Family and friends	25(66)	13(44)	30(71)	12(29)	33(73)	12(27)	28(80)	7(20)	46(79)	12(21)	30(56)	24(44)	46(75)	15(25)
15.	Seminars for diabetics	9(24)	29(76)	13(31)	29(69)	9(20)	36(80)	10(29)	25(71)	22(38)	36(62)	12(22)	42(78)	36(46)	25(54)
16.	Other patients with diabetes	24(63)	14(37)	37(88)	5(12)	27(60)	18(40)	31(89)	4(11)	40(69)	18(31)	43(80)	11(20)	43(70)	18(30)

Keys: FMC BIDA: Federal Medical Centre Bida, **FMC MAK**: Federal Medical Centre Makurdi, **FMC LKJ:** Federal Medical Centre Lokoja, **FMC KEF**: Federal Medical Centre Keffi, **UATH:** University of Abuja Teaching Hospital, **UITH**: University of Ilorin Teaching Hospital and **JUTH**: Jos University Teaching Hospital

Table 4.7 shows the types of health information resources consulted by diabetic patients in tertiary health facilities in North Central Nigeria. As revealed in Table 4.7, the items with a (Yes) percentage value above 50% are considered health information sources consulted by the respondents studied. In Federal Medical Centre Bida, Niger State, the health information sources used by diabetic patients are; Booklets, brochures, leaflets, etc from clinic or health professionals 22(58%), Magazines/newspaper/news magazines 20(53%), Internet 31(82%), WhatsApp groups 28(74%), Facebooks pages/Facebook groups 26(68%), Health professionals 36(95%), Family and friends 25(66%) and other patients with diabetes 24(63%). Also, in Federal Medical Centre Makurdi, Benue State, the health information sources used are Internet 32(76%), WhatsApp groups 39(93%), Health professionals 34(81%), Broadcasting Media (Television, radio) 25(60%) Family and friends 30(71%) and other patients with diabetes 37(88%). Furthermore, at Federal Medical Centre Lokoja, Kogi State, the health information sources consulted are Booklets, brochures, leaflets, etc from clinic or health professionals 32(71%), Magazines/newspaper/news magazines 25(56%), Internet 30(67%), WhatsApp groups 26(58%), Broadcasting Media (Television, radio) 27(60%), Health professionals 40(89%), Family and friends 33(73%) and other patients with diabetes 27(60%).

The study revealed that in Federal Medical Centre Keffi, Nasarawa State, the health information sources used are: Journal articles 18(51%), Booklets, brochures, leaflets, etc. from clinics or health professionals 27(77%), Magazines/newspapers/news magazine 22(52%), Internet 20(57%), WhatsApp groups 19(54%), Facebook pages/Facebook groups 23(66%), Health professionals 30(86%), Broadcasting Media (Television, radio) 24(69%), and other patients with diabetes 31(89%). At the University of Ilorin Teaching Hospital in

Kwara State, the health information sources used by patients with diabetes are Books 32(55%), Booklets, brochures, leaflets, etc. from clinic or health professionals 42(72%), Magazines/newspapers/news magazine 49(84%), Internet 45(76%), WhatsApp groups 35(60%), Facebook pages/Facebook groups 38(66%), Health professionals 52(90%), Family and friends 46(79%), and other patients with diabetes 40(69). Also, at Jos University Teaching Hospital in Plateau State, Booklets, brochures, leaflets, etc from clinic or health professionals 43(80%), Magazines/newspaper/news magazine 39(72%), Internet 35(65%), WhatsApp groups 41(76%), Facebook pages/Facebook groups 34(63%), Health professionals 47(87%), Broadcasting Media (Television, radio) 39(72%), Family and Friends 30(56%) and other patients with diabetes 43(80%). At the same time, the study showed in the University of Abuja Teaching Hospital that the health information consulted are Booklets, brochures, leaflets etc., from clinics or health professionals 54(86%), Magazines/newspapers/news magazines 50(82%), Internet 48(79%), WhatsApp groups 45(74%), Facebook pages/Facebook groups 51(84%), Blogs 34(56%), Health professionals 57(93%), Broadcasting Media (Television, radio) 38(62%), Family and Friends 46(75%) and other patients with diabetes 43(70%).

4.3.2 : Research Question 2: What are the information needs of diabetic patients in tertiary healthcare facilities in North Central Nigeria?

The respondents were asked to indicate their health information needs. Table 4.8 provides the following responses.

Table 4.8: Information Needs of Diabetic Patients in Tertiary Healthcare Facilities in North-Central Nigeria

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	I need information on what diabetes means	2.87	1.14	2.81	1.25	2.02	1.20	3.03	1.24	2.21	1.21	2.65	1.20	2.23	1.22	**2.55**	Agreed
2	I need information on the symptoms of diabetes	2.87	1.14	2.67	1.20	2.67	1.20	2.77	1.11	2.10	1.14	2.85	1.12	2.15	1.21	**2.58**	Agreed
3	I need information on the causes of diabetes	1.71	0.98	2.55	1.25	2.53	1.22	2.83	1.07	2.03	1.08	2.52	1.02	2.33	1.09	**2.36**	Dis
4	I need information on the complications of diabetes	1.92	1.12	2.74	1.31	2.63	1.21	2.77	1.24	2.16	1.15	2.61	1.32	2.82	1.31	**2.52**	Agreed
5	I need information on the proper diet for people with diabetes	2.63	1.26	2.55	1.25	2.67	1.02	3.14	1.03	2.98	1.18	2.81	1.19	2.90	1.21	**2.81**	Agreed
6	I need information on the right exercise for diabetic patients	2.16	1.29	2.93	1.24	2.31	1.29	2.91	1.07	2.72	1.27	2.76	1.22	2.89	1.21	**2.67**	Agreed
7	I need information on the new medications for diabetes	2.66	1.02	2.14	1.14	2.13	1.10	2.03	1.01	2.31	1.13	2.57	0.94	2.84	0.92	**2.38**	Disagreed
8	I need information on when I should start taking insulin and how I should use insulin	2.55	1.00	1.98	0.98	2.62	1.17	1.97	1.07	2.69	1.20	2.65	1.15	2.70	1.16	**2.45**	Disagreed
9	I need information on the measures taken to avoid foot complications of DM	1.82	1.11	2.60	1.27	2.51	1.22	2.06	1.19	2.93	1.11	2.09	1.17	2.82	1.33	**2.4**	Disagreed
10	I need information on the symptoms of hypoglycemia	2.66	1.17	2.17	1.12	2.11	1.11	2.34	1.06	2.10	1.14	2.30	1.27	2.21	1.11	**2.27**	Disagreed
11	I need information on the sexual problems due to diabetes	1.79	1.04	2.67	1.30	2.49	1.24	2.40	1.22	1.98	1.19	1.98	1.18	1.92	1.16	**2.18**	Disagreed
12	I need information on what to do in case of another illness (such as infection)	1.79	0.91	1.95	1.10	2.58	1.21	2.17	1. 09	2.10	1.17	1.78	0.84	2.13	1.02	**2.07**	Disagreed
	Weighted Mean	**2.28**	**0.22**	**2.48**	**0.02**	**2.44**	**0.06**	**2.54**	**0.04**	**2.36**	**0.14**	**2.46**	**0.04**	**2.50**	**0.00**		

Table 4.8 reveals the health information needs of diabetic patients in tertiary healthcare facilities in North Central Nigeria. Items with a mean score value greater or equal to 2.50 bench mark mean on a four point Likert scale is considered to be positive about the statement made. Therefore, from Federal Medical Centre Bida, Niger State the information needs of the respondents are: item 1: I need information on what diabetes means (= 2.87, StD=1.14); item 2: I need information on the symptoms of diabetes (= 2.87, StD=1.14); item 5: I need information on the proper diet for people with diabetes (= 2.63, StD=1.26);item 7: I need information on the new medications for diabetes (= 2.66, StD=1.02); and item 10: I need information on the symptoms of hypoglycaemia (= 2.66, StD=1.17). At Federal Medical Centre Makurdi, the items with a mean score value greater or equal to 2.50 bench mark mean on a four point Liker scale are: item 1: I need information on what diabetes means (= 2.81, StD=1.25); item 2: I need information on the symptoms of diabetes (= 2.67, StD=1.20); item 3: I need information on the causes of diabetes (= 2.55, StD=1.25); item 4: I need information on the complications of diabetes (= 2.74, StD=1.31); item 5: I need information on the proper diet for people with diabetes (= 2.55, StD=1.25); item 6: I need information on the right exercise for diabetic patients (= 2.93, StD=1.24); item 9: I need information on the measures taken to avoid foot complications ofDM (= 2.60, StD=1.27) and item 11: I need information on the sexual problems due to diabetes (= 2.67, StD=1.30). Furthermore at Federal Medical Centre Lokoja in Kogi State, the study showed that the health information needs are: item 2: I need information onthe symptoms of diabetes (= 2.67, StD=1.20); item 3: I need information on the causes of diabetes (= 2.53, StD=1.22); item 4: I need information on the complications of diabetes(= 2.77, StD=1.24); item 6: I need information on the right exercise for diabetic patients

($\bar{X}$= 2.67, StD=1.02) and item 8: I need information on when to start taking insulin (= 2.62, StD=1.17). Similarly, at Federal Medical Centre Keffi, Nasarawa state, the items with a means score above 2.50 on a four-point Likert scale are: item 1: I need information on what diabetes means (= 3.03, StD=1.24); item 2: I need information on the symptoms of diabetes (= 2.77, StD=1.11); item 3: I need information on the causes of diabetes (= 2.83, StD=1.07); item 4: I need information on the complications of diabetes (= 2.77, StD=1.24); item 5: I need information on the proper diet for people with diabetes (= 3.14, StD=1.03) and item 6: I need information on the right exercise for diabetic patients (= 2.91, StD=1.07). The study unravelled at the University of Ilorin Teaching Hospital that the health information needs of the respondents are: item 5: I need information on the proper diet for people with diabetes (= 2.98, StD=1.183) and item 6: I need information on the right exercise for diabetic patients (= 2.72, StD=1.27). item 8: I need information on when to start taking insulin (= 2.69, StD=1.20) and item 9: I need information on the measures taken to avoid foot complications of DM (= 2.93, StD=1.11). Also at Jos University Teaching Hospital, the items with a mean score above the 2.50 benchmark mean on a four point Liker scale are:: item 1: I need information on what diabetes means (= 2.65, StD=1.20); item 2: I need information on the symptoms of diabetes (= 2.85, StD=1.12); item 3: I need information on the causes of diabetes (= 2.52, StD=1.02); item 4: I need information on the complications of diabetes (= 2.61, StD=1.34); item 5: I need information on the proper diet for people with diabetes (= 2.81, StD=1.19); item 6: I need information on the right exercise for diabetic patients (= 2.76, StD=1.22), item 7: I need information on the new medications for diabetes. (= 2.57, StD=1.15) and item 8: I need $\bar{X}$

information on when to start taking insulin ($\bar{x}$ 2.65, StD=1.15). Finally, in the University of Abuja Teaching Hospital, the items with a means score above 2.50 benchmark mean are item 4: I need information on the complications of diabetes (= 2.82, StD=1.31); item 5: I need information on the proper diet for people with diabetes (= 2.90, StD=1.21); item 6: I need information on the right exercise for diabetic patients (= 2.89, StD=1.12), item 7: I need information on the new medications for diabetes. (=2.84, StD=0.92); item 8: I need information on when to start taking insulin (= 2.70, StD=1.16) and item 9: I need information on the measures taken to avoid foot complications of DM (= 2.82, StD=1.33).

4.3.3 : What is the health information seeking behaviour of diabetic patients in tertiary healthcare facilities in North Central Nigeria?

The respondents were asked to indicate their health information-seeking behaviours. Table 4.9 provides the following responses

Table 4.9: Health information seeking behaviour of diabetic patients in tertiary healthcare facilities in North Central Nigeria

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	I seek health information from books for the management of diabetes	2.08	1.14	2.00	1.04	2.09	1.06	2.17	1.09	2.17	1.14	2.17	1.11	2.03	1.08	**2.10**	Disagreed
2	I seek health information from journal articles for the management of diabetes	2.03	1.10	1.69	0.92	1.84	1.07	1.89	0.99	1.95	1.08	2.04	1.09	1.98	1.06	**1.92**	Disagreed
3	I seek health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the management of diabetes	2.53	1.22	2.12	1.13	2.78	1.17	2.74	1.24	2.84	1.04	2.81	1.12	2.75	1.08	**2.65**	Agreed
4	I seek health information from magazines/newspaper/news magazines for the management of diabetes	2.37	1.34	2.26	1.21	2.71	1.29	2.20	1.11	2.66	1.16	2.33	1.32	2.72	1.17	**2.46**	Disagreed
5	I seek health information from the Internet for the management of diabetes	2.87	1.27	3.00	1.15	2.93	1.14	2.71	1.10	2.88	1.17	2.93	1.16	3.03	1.10	**2.91**	Agreed
6	I seek health information from WhatsApp groups for the management of diabetes	3.24	0.13	3.02	1.05	2.95	0.99	2.89	0.97	2.84	1.02	2.94	1.04	2.67	1.01	**2.94**	Agreed
7	I seek health information from Facebook pages/Facebook groups for the management of diabetes	2.82	1.18	2.62	1.17	2.69	1.15	2.94	1.08	2.52	1.20	2.65	1.24	2.74	1.17	**2.71**	Agreed

8	I seek health information from Blogs for the management of diabetes	1.74	1.03	1.64	0.91	2.59	1.09	1.89	1.02	2.34	1.12	2.74	1.02	2.67	1.06	**2.23**	Disagreed
9	I seek health information from Twitter for the management of diabetes	1.92	1.02	1.76	1.06	1.89	1.09	1.80	1.05	1.91	0.99	1.98	1.07	1.92	1.04	**1.88**	Disagreed
10	I seek health information from Instagram for the management of diabetes	2.16	1.10	2.05	1.04	2.13	1.08	1.97	1.04	2.41	1.17	2.19		2.79	1.08	**2.24**	Disagreed
11	I seek information from health professionals for the management of diabetes	2.79	0.93	2.50	0.99	2.58	0.94	2.63	0.94	2.81	1.18	3.06	0.94	2.67	1.15	**2.72**	Agreed
12	I seek health information from broadcast media (television, radio) for the management of diabetes	2.37	1.08	2.71	1.22	2.38	1.21	2.80	1.13	2.57	1.19	2.07	1.13	2.25	1.22	**2.45**	Disagreed
13	I seek information from Diabetic Patients' Associations for the management of diabetes	1.92	1.15	1.83	0.98	1.84	0.95	2.00	1.00	2.21	1.12	2.00	1.05	2.57	1.09	**2.05**	Disagreed
14	I seek information from family and friends for the management of diabetes	3.08	1.02	2.90	1.08	2.76	1.07	2.63	0.94	2.78	1.19	3.07	0.56	3.10	1.04	**2.9**	Agreed
15	I seek information seminars for diabetics for the management of diabetes	1.84	1.10	1.90	1.01	2.07	1.00	1.89	0.50	2.47	1.11	2.26	1.12	2.33	1.11	**2.11**	Disagreed
16	I seek information from other patients with diabetes for the management of diabetes	1.76	0.99	2.60	1.27	2.67	1.11	2.80	1.16	2.21	1.18	2.56	1.21	2.48	1.19	**2.44**	Disagreed
	Weighted Mean	**2.35**	**0.35**	**2.29**	**0.21**	**2.43**	**0.07**	**2.37**	**0.13**	**2.47**	**0.03**	**2.49**	**0.01**	**2.54**	**0.04**		

Table 4.9 reveals the health information seeking behaviour of diabetic patients in tertiary healthcare facilities in North Central Nigeria. Items with a mean score value greater or equal to 2.50 bench mark mean on a four point Likert scale is considered to be positive about the statement made. Table 4.9 revealed that at Federal Medical Centre Bida, Niger State, the following items have a mean score greater than the 2.50 bench mark mean. They are: Item 3: I seek health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the management of diabetes (= 2.53, StD=1.10); Item 5: I seek health information from the Internet for the management of diabetes (= 2.87, StD=1.27); Item 6: I seek health information from WhatsApp groups for the management of diabetes(= 3.24, StD=0.13); Item 7: I seek health information from Facebook pages/Facebook groups for the management of diabetes (= 2.82, StD=1.18); Item 11: I seek information from health professionals for the management of diabetes (= 2.72, StD=1.08) and Item 14 I seek information from family and friends for the management of diabetes (= 3.08, StD=1.02). Also at Federal Medical Centre Makurdi, Benue State the items with a mean score greater than 2.50 are: Item 5: I seek health information from the Internet for the management of diabetes (= 3.00, StD=1.15); Item 6: I seek health information from WhatsApp groups for the management of diabetes (= 3.02, StD=1.05); Item 7: I seek health information from Facebook pages/Facebook groups for the management of diabetes(= 2.62, StD=1.17); Item 11: I seek information from health professionals for the management of diabetes (= 2.50, StD= 0.99); Item 12: I seek health information from broadcast media (television, radio) for the management of diabetes (= 2.71, StD=1.22); Item 14: I seek information from family and friends for the management of diabetes (= 2.90, StD=1.08); and Item 16: I seek information from other patients with diabetes for the

management of diabetes ($\bar{x}$ = 2.60, StD = 1.27). Furthermore, at Federal Medical Centre Lokoja, Kogi State, the items with a means score greater than 2.50 bench mark mean are: Item 3: I seek health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the management of diabetes (= 2.78, StD=1.17); Item 4: I seek health information from magazines/newspaper/news magazines for the management ofdiabetes (= 2.71, StD=1.29); Item 5: I seek health information from the Internet for the management of diabetes (= 2.93, StD=1.14); Item 6: I seek health information from WhatsApp groups for the management of diabetes (= 2.95, StD=0.99); Item 7: I seek health information from Facebook pages/Facebook groups for the management of diabetes(= 2.69, StD=1.15); Item 8: I seek health information from Blogs for the management of diabetes (= 2.59, StD=1.09); Item 11: I seek information from health professionals for the management of diabetes (= 2.58, StD=0.94); Item 14: I seek information from family and friends for the management of diabetes (= 2.76, StD=1.07) and Item 16: I seek information from other patients with diabetes for the management of diabetes (= 2.67, StD=1.11). The study at Federal Medical Centre Keffi, Nasarawa State showed seven itemswith a mean score above the 2.50 bench mark mean on a four-point Liker scale. These are: Item 3: I seek health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the management of diabetes (= 2.74, StD=1.24); Item 6: I seek health information from WhatsApp groups for the management of diabetes (= 2.89, StD=0.97); Item 7: I seek health information from Facebook pages/Facebook groups for themanagement of diabetes (= 2.94, StD=1.08); Item 11: I seek information from health professionals for the management of diabetes (= 2.63, StD = 0.94); Item 12: I seek health information from broadcast media (television, radio) for the management of diabetes (=

2.80, StD=1.13); Item 14: I seek information from family and friends for the management of diabetes (= 2.63, StD= 0.94) and Item 16: I seek information from other patients with diabetes for the management of diabetes (= 2.80, StD=1.16). Similarly, at University of Ilorin Teaching Hospital, Kwara state, the items with mean score above 2.50 bench mark mean are: Item 3: I seek health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the management of diabetes (= 2.84, StD=1.04); Item 4:I seek health information from magazines/newspaper/news magazines for the management of diabetes (= 2.66, StD=1.16); Item 5: I seek health information from the Internet for the management of diabetes (= 2.88, StD=1.17); Item 6: I seek health information from WhatsApp groups for the management of diabetes (= 2.84, StD=1.02); Item 7: I seek health information from Facebook pages/Facebook groups for the management of diabetes(= 2.52, StD=1. 20); Item 11: I seek information from health professionals for themanagement of diabetes (= 2.81, StD=1.18); Item 12: I seek health information from broadcast media (television, radio) for the management of diabetes (= 2.57, StD=1.19)and Item 14: I seek information from family and friends for the management of diabetes(= 2.78, StD=1.19). At Jos University Teaching Hospital Plateau state, the items with a mean score above the 2.50 bench mark mean are: Item 3: I seek health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the managementof diabetes (= 2.81, StD=1.12); Item 5: I seek health information from the Internet for the management of diabetes (= 2.93, StD=1.16); Item 6: I seek health information from WhatsApp groups for the management of diabetes (= 2.94, StD=1.04); Item 7: I seek health information from Facebook pages/Facebook groups for the management of diabetes(= 2.65, StD=1.24); Item 8: I seek health information from Blogs for the management of

diabetes ($\bar{X}$= 2.74, StD=1.02); Item 11: I seek information from health professionals for the management of diabetes ($\bar{X}$= 3.06, StD=0.94); Item 14: I seek information from family and friends for the management of diabetes (= 3.07, StD=0.56) and Item 16: I seek information from other patients with diabetes for the management of diabetes (= 2.56, StD=1.21). At the University of Abuja Teaching Hospital, the items with the mean score that is above the 2.50 bench mark mean are: Item 3: I seek health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the managementof diabetes (= 2.75, StD=1.08); Item 4: I seek health information from magazines/newspaper/news magazines for the management of diabetes (= 2.72, StD=1.17); Item 5: I seek health information from the Internet for the management of diabetes (= 3.03, StD=1.10); Item 6: I seek health information from WhatsApp groups for the management of diabetes (= 2.67, StD=1.01); Item 7: I seek health information from Facebook pages/Facebook groups for the management of diabetes (= 2.74, StD=1.17); Item 8: I seek health information from Blogs for the management of diabetes (= 2.67, StD=1.06); Item 10: I seek health information from Instagram for the management of diabetes (= 2.79, StD=1.08); Item 11: I seek information from health professionals for the management of diabetes (= 2.67, StD=1.15); Item 13: I seek information from Diabetic Patients' Associations for the management of diabetes (= 2.57, StD=1.09) and Item 14: I seek information from family and friends for the management of diabetes (= 3.10, StD=1.04).

4.3.4 : Research Question 4: What is the frequency of usage of health information for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria?

The respondents were asked to indicate how frequently they use health information to manage diabetes mellitus. Table 4.10. provides the following responses

Table 4.10: Frequency of usage of health information for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	I use books	2.00	1.21	2.05	1.23	2.07	1.29	2.29	1.45	2.17	1.30	2.02	1.22	2.00	1.20	**2.09**	Low
2	I use journal articles	2.13	1.12	2.17	1.34	2.09	1.33	2.40	1.39	2.16	1.18	2.11	1.04	2.13	1.06	**2.17**	Low
3	I use booklets, brochures, leaflets, etc., from clinic or health professionals	3.13	1.30	3.07	1.30	3.67	1.31	2.11	1.28	3.41	1.26	3.31	1.24	3.44	1.13	**3.16**	High
4	I use magazines/newspaper/news magazines	2.03	1.32	2.17	1.36	2.13	1.33	2.40	1.33	3.24	1.36	2.20	1.23	2.21	1.21	**2.34**	Low
5	I use Internet	3.16	1.35	3.60	1.43	3.42	1.53	3.54	1.42	3.26	1.43	3.56	1.31	3.34	1.45	**3.41**	High
6	I use WhatsApp groups	3.18	1.45	3.14	1.48	3.18	1.45	3.14	1.39	3.36	1.44	3.26	1.48	3.23	1.49	**3.21**	High
7	I use Facebook pages/Facebook groups	3.03	1.64	3.45	1.64	3.44	1.63	3.20	1.59	3.34	1.58	3.57	1,52	3.43	1.59	**3.35**	High
8	I use Blogs	1.74	1.22	1.67	1.16	3.47	1.59	1.86	1.35	2.91	1.43	3.56	1.54	3.54	1.43	**2.68**	Low
9	I use Twitter	2.29	1.29	2.21	1.20	2.40	2.58	2.14	1.19	2.43	1.14	2.15	1.22	2.30	1.28	**2.27**	Low
10	I use Instagram	2.37	1.36	2.43	1.36	2.58	1.37	2.31	1.30	2.60	1.47	2.57	1.48	3.10	1.42	**2.57**	Low
11	I use Health professionals	2.95	1.16	3.40	1.31	3.22	1.47	3.29	1.32	3.00	1.20	3.24	1.26	3.10	1.19	**3.17**	High
12	I use Broadcast media (T.V, radio)	2.29	1.37	3.26	1.48	2.67	1.39	2.60	1.63	3.03	1.45	2.39	1.29	2.52	1.42	**2.68**	Low
13	I use Diabetic Patients' Associations	2.13	1.10	2.17	1.25	2.13	1.24	2.23	1.24	2.74	1.45	2.50	1.32	2.49	1.39	**2.34**	Low
14	I use Family and friends	3.13	1.09	3.07	1.28	3.47	1.18	3.29	1.24	3.02	1.40	3.04	1.35	3.18	1.31	**3.17**	High
15	I use Seminars for diabetics	2.47	1.11	2.26	1.11	2.16	0.99	2.14	1.12	3.33	1.39	2.89	1.50	2.33	1.45	**2.51**	Low
16	I use other patients with diabetes	1.89	1.00	3.43	1.655	3.62	1.56	3.03	1.62	2.72	1.40	2.87	1.50	2.98	1.52	**2.93**	Low
	Weighted Mean	**2.50**	**0.50**	**2.72**	**0.28**	**2.86**	**0.14**	**2.62**	**0.38**	**2.92**	**0.08**	**2.83**	**0.17**	**2.83**	**0.17**		

Table 4.10 reveals the frequency of usage of health information for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria. Items with a mean score value greater or equal to 3.0 bench mark mean on a five- point Likert scale is considered to be positive about the statement made. Therefore, table 4.10 revealed that at Federal Medical Centre Bida, Niger State, the items with a mean score greater than the 3.0 bench mark mean are: Item 3: Booklets, brochures, leaflets, etc., from clinic or health professionals ($\bar{X}$= 3.13, StD =1.30); Item 5: Internet ($\bar{X}$= 3.16, StD =1.35); Item 6: WhatsApp groups ($\bar{X}$= 3.18, StD =1.45); Item 7: Facebook pages/Facebook groups ($\bar{X}$= 3.03, StD =1.64) and Item 14: Family and friends ($\bar{X}$ = 3.13, StD =1.09). At Federal Medical Centre Makurdi, Benue State, the items with a mean score greater than the 3.0 bench mark mean are: Item 3: Booklets, brochures, leaflets, etc., from clinic or health professionals ($\bar{X}$ = 3.07, StD =1.34); Item 5: Internet ($\bar{X}$ = 3.60, StD =1.43); Item 6: WhatsApp groups ($\bar{X}$ = 3.14, StD =1.14); Item 7: Facebook pages/Facebook groups ($\bar{X}$ = 3.45, StD =1.64); Item 11: Health professionals ($\bar{X}$ = 3.40, StD =1.28); Item 12: Broadcast media (television, radio) ($\bar{X}$ = 3.26, StD =1.48); Item 14: Family and friends ($\bar{X}$ = 3.07, StD =1.28); Item 16: Other patients with diabetes ($\bar{X}$ = 3.43, StD =1.65). From Federal Medical Centre Lokoja, Kogi State, the items with a mean score greater than the 3.0 bench mark mean are: Item 3: Booklets, brochures, leaflets, etc., from clinic or health professionals ($\bar{X}$ = 3.67, StD =1.31); Item 5: Internet ($\bar{X}$ = 3.42, StD =1.53); Item 6: WhatsApp groups ($\bar{X}$ = 3.18, StD =1.45); Item 7: Facebook pages/Facebook groups ($\bar{X}$ = 3.44, StD =1.63); Item 8: Blogs ($\bar{X}$ = 3.47, StD =1.59); Item 11: Health professionals ($\bar{X}$ =3.22, StD =1.47); Item 14: Family and friends ($\bar{X}$ = 3.47, StD =1.18) and Item 16: Other patients with diabetes ($\bar{X}$ = 3.62, StD =1.62). At Federal Medical Centre Keffi, Nasarawa

state, the items with a mean score greater than the 3.0 bench mark mean are: Item 5: Internet (= 3.54, StD =1.42); Item 6: WhatsApp groups (= 3.14, StD =1.39); Item 7: Facebook pages/Facebook groups (= 3.20, StD =1.59); Item 11: Health professionals(= 3.29, StD =1.32); Item 14: Family and friends (= 3.29, StD =1.24); Item 16: Other patients with diabetes (= 3.03, StD =1.62). Also, at University of Ilorin Teaching Hospital, the items with a mean score greater than the 3.0 bench mark mean are: Item 3: Booklets, brochures, leaflets, etc., from clinic or health professionals (= 3.41, StD =1.26); Item 4: Magazines/newspaper/news magazines ($\bar{X}$= 3.24, StD =1.26); Item 5: Internet (= 1.42, StD =1.36); Item 6: WhatsApp groups (= 3.36, StD =1.44); Item 7: Facebook pages/Facebook groups ($\bar{X}$= 3.34, StD =1.58); Item 11: Health professionals (= 3.00, StD =1.20); Item 12: Broadcast media (television, radio) (= 3.03, StD =1.45); Item 14: Family and friends (= 3.02, StD =1.40); Item 15: Seminars for diabetics (= 3.33, StD =1.39). At Jos University Teaching Hospital, Plateau state, the items with a meanscore greater than the 3.0 bench mark mean are: Item 3: Booklets, brochures, leaflets, etc., from clinic or health professionals (= 3.31, StD =1.24); Item 5: Internet (= 3.56, StD =1.31); Item 6: WhatsApp groups ($\bar{X}$= 3.26, StD =1.48); Item 7: Facebook pages/Facebook groups (=3.57, StD =1.52); Item 8: Blogs (= 3.56, StD =1.54); Item 11: Health professionals (= 3.24, StD =1.26) and Item 14: Family and friends (= 3.04, StD =1.35). And finally, at University of Abuja Teaching Hospital, the items with a mean score greater than the 3.0 bench mark mean are: Item 3: Booklets, brochures, leaflets, etc., from clinic or health professionals ($\bar{X}$= 3.44, StD =1.13); Item 5: Internet ($\bar{X}$= 3.34, StD =1.13); Item 6: WhatsApp groups ($\bar{X}$= 3.23, StD =1.49); Item 7: Facebook pages/Facebook groups ($\bar{X}$= 3.43, StD =1.59); Item 8: Blogs ($\bar{X}$= 3.54, StD =1.43); Item 10: Instagram

($\bar{x}$ = 3.10, StD =1.42); Item 11: Health professionals ($\bar{x}$ = 3.10, StD =1.19) and Item 14: Family and friends ($\bar{x}$ = 3.18, StD =1.31).

4.3.5 : Research Question 5: What is the health information literacy skill for the management of diabetes mellitus by diabetic patients in tertiary health facilities in North Central, Nigeria?

The respondents were asked to indicate their health information literacy skills for the management of diabetes mellitus. Table 4.11 provides the following responses.

Table : 4.11: Health Information Literacy Skills for the Management of Diabetes Mellitus

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	I have computer and Internet navigation skills	1.68	0.9	2.83	1.12	2.62	1.15	2.91	1.12	2.59	1.03	2.65	1.13	2.75	1.08	**2.58**	Agreed
2	I have the skills in sharing health information across various platforms	1.79	1.09	2.52	1.31	2.76	1.51	2.63	1.31	2.71	1.12	2.50	1.18	2.57	1.09	**2.5**	Agreed
3	I have the skills to identify health information sources	2.53	1.20	2.71	1.15	2.73	1.12	2.71	1.13	2.53	1.06	2.56	1.16	2.67	1.15	**2.63**	Agreed
4	I have the skills to recognize my health information needs	2.74	1.06	2.88	1.11	2.60	1.12	2.83	1.01	2.74	0.93	2.57	1.06	2.61	1.13	**2.71**	Agreed
5	I have the skills to assess quality health information	2.08	1.17	2.52	1.19	2.56	1.16	2.54	1.72	2.62	1.10	2.63	1.12	2.31	1.21	**2.47**	Disagreed
6	I have the skills to retrieve health information resources	2.76	1.12	2.67	1.07	2.24	1.21	2.06	1.03	2.52	1.06	2.26	1.23	2.72	1.09	**2.46**	Disagreed
7	I have the skills on how to use health information to make a good decision	2.53	1.18	2.74	1.09	2.71	0.99	2.71	1.02	2.79	0.99	2.80	1.03	2.80	1.25	**2.73**	Agreed
	Weighted Mean	**2.30**	**0.20**	**2.70**	**0.20**	**2.60**	**0.10**	**2.63**	**0.13**	**2.64**	**0.14**	**2.57**	**0.07**	**2.63**	**0.13**		

Table 4.11 reveals the health information literacy skills for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria. Items with a mean score value greater or equal to 2.50 benchmark mean on a four-point Likert scale are considered positive about the statement made. Therefore, the health information literacy skills of the respondents are item 1: Computer and Internet navigation skills (= 2.58, StD=0.08); item 2: Skills in sharing health information across various platforms (= 2.50, StD=0.01); item 3: Skills to identify health information sources (= 2.63, StD=0.1); item 4: Skills to recognize my health information needs (= 2.71, StD=0.21); and item 7: Skills on how to use health information to make a good decision (= 2.73, StD=0.23). Meanwhile, the other two items, namely item 4 and item 5, have a mean score less than the benchmark mean of 2.50 on a four-point Likert scale. Furthermore, Table 4.11 revealed thatacross all the seven tertiary healthcare facilities studied, only Federal Medical Centre, Bida,Niger State has a weighted mean score less than the benchmark mean of 2.50. In contrast, others have a mean score above the benchmark mean of 2.50 on a four-point Likert scale. This shows that the health information literacy skills for the management of diabetesmellitus by diabetic patients in the tertiary healthcare facilities studied in North Central Nigeria are relatively high.

4.3.6 : What is the level of satisfaction derived from using health information bydiabetic patients in tertiary healthcare facilities in North Central, Nigeria?

The respondents were asked to indicate the satisfaction derived from using health information for managing diabetes mellitus. Table 4.12 provides the following responses.

Table 4.12: Level of Satisfaction Derived in the Use of Health Information by Diabetic Patients

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	How satisfied are you with the use of books?	1.66	0.88	1.95	0.90	2.11	1.07	2.03	1.04	2.07	1.21	1.81	1.06	1.89	1.16	**1.93**	Not Satisfied
2	How satisfied are you with the use of journal articles?	2.03	1.03	2.07	0.92	1.98	1.05	2.00	1.03	2.12	1.03	1.89	0.93	2.00	1.08	**2.01**	Not Satisfied
3	How satisfied are you with the use of booklets, brochures, leaflets, etc., from clinics or health professionals?	1.71	1.01	2.67	1.20	2.62	1.17	2.26	1.07	2.53	1.17	2.54	1.13	2.15	1.09	**2.35**	Not Satisfied
4	How satisfied are you with using magazines/newspapers/news magazines?	1.84	1.00	1.86	1.14	2.53	1.14	2.00	1.16	2.24	1.17	1.72	0.92	2.31	1.21	**2.07**	Not Satisfied
5	How satisfied are you with the use of the Internet?	2.58	1.22	2.71		3.27	0.98	2.60	1.19	2.88	1.20	2.96	1.16	2.69	1.15	**2.81**	Satisfied
6	How satisfied are you with the use of WhatsApp groups?	2.97	1.08	3.83	1.06	2.98	1.09	2.80	1.03	2.84	0.98	3.00	1.00	2.92	0.95	**3.05**	Satisfied
7	How satisfied are you with the use of Facebook pages/Facebook groups?	2.66	1.15	2.64	1.14	2.93	1.09	2.71	1.07	2.93	1.07	2.63	1.07	2.82	1.04	**2.76**	Satisfied
8	How satisfied are you with the use of blogs?	1.92	1.08	2.02	0.98	2.67	1.26	2.03	1.01	2.76	0.92	2.65	1.14	2.72	1.09	**2.40**	Not Satisfied
9	How satisfied are you with the use of twitter?	1.79	1.12	1.86	1.05	1.89	1.00	1.83	0.98	2.00	1.11	1.87	1.18	1.90	1.14	**1.88**	Not Satisfied

10	How satisfied are you with the use of Instagram?	1.92	0.94	1.88	0.89	1.78	0.87	2.00	0.97	2.50	1.25	2.06	1.04	2.03	1.02	**2.02**	Not Satisfied
11	How satisfied are you with the use of Health professionals?	2.68	1.25	2.86	1.24	2.91	1.20	2.86	1.24	2.74	1.10	2.76	1.16	2.79	1.23	**2.80**	Satisfied
12	How satisfied are you with the use of broadcast media (television, radio)?	2.24	1.10	2.55	1.15	2.64	1.15	2.34	1.16	2.53	1.11	2.33	1.06	2.39	1.05	**2.43**	Not Satisfied
13	How satisfied are you with the use of Diabetic Patients'? Associations?	1.87	1.21	1.76	1.10	1.96	1.13	1.91	1.07	2.31	1.29	2.13	1.22	2.43	1.36	**2.05**	Not Satisfied
14	How satisfied are you with the use of family and friends?	2.55	1.08	2.74	1.06	2.67	0.95	2.71	1.10	2.74	1.05	2.81	1.08	2.70	1.04	**2.70**	Satisfied
15	How satisfied are you with the use of seminars for diabetics?	2.11	1.20	1.93	1.14	1.87	1.06	1.94	1.03	2.62	1.18	2.30	1.13	2.43	1.07	**2.17**	Not Satisfied
16	How satisfied are you with the use of health information from other patients with diabetes?	2.92	1.19	2.95	1.209	2.89	1.15	2.69	1.23	2.72	1.11	2.39	1.18	2.61	1.13	**2.74**	Satisfied
	Weighted Mean	**2.22**	**0.28**	**2.40**	**0.10**	**2.48**	**0.02**	**2.29**	**0.21**	**2.53**	**0.03**	**2.37**	**0.23**	**2.42**	**0.18**		

Table 4.12 reveals the level of satisfaction derived from the use of health information for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria. Items with a mean score value greater or equal to 2.50 benchmark mean on a four-point Likert scale are considered positive about the statement made. Therefore, the satisfaction derived in the use of health information sources used by the respondents is: item 5: Satisfied with the use of Internet (= 2.81, StD=0.31); item 6: Satisfied with the use of WhatsApp groups (= 3.05, StD=0.05); item 7: Satisfied with the use of Facebook (= 2.76, StD=0.26); item 11: Satisfied with the use of health information from health professionals (= 2.80, StD=0.30) and item 14: Satisfied with the use of health information from family and friends (= 2.70, StD=0.20). Meanwhile, the other items have a mean score less than the benchmark mean of 2.50 on a four-point Likert scale. Also, from Table 4.12, the analysis showed that it is only University of IlorinTeaching Hospital that diabetic patients derived high satisfaction from the health information resources used by diabetic patients.

4.3.7 :Research Question 7: What is the effect of health information-seeking behaviour on the mental health of diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

The respondents were asked to indicate the effect of health information-seeking behaviour on their mental health. Table 4.13 provides the following responses.

Table 4.13: Effect of Health Information Seeking Behaviour on the Mental Health of Diabetic Patients

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	Does your information-seeking behaviour make you anxious?	1.87	9.63	2.69	1.20	2.11	1.13	2.00	1.11	2.97	1.14	2.20	1.08	2.20	1.12	**2.29**	Disagreed
2	Does your information-seeking behaviour make you depressed?	2.47	1.31	2.57	1.19	2.58	1.14	2.51	1.27	2.60	1.24	2.50	1.24	2.61	1.24	**2.55**	Agreed
3	Does your information-seeking behaviour affect your personality?	2.37	1.24	2.10	1.16	1.91	1.13	1.86	1.09	2.71	1.20	2.31	1.18	2.67	1.18	**2.28**	Disagreed
4	Does your information-seeking behaviour cause you delusion?	1.79	0.99	2.05	1.15	1.98	1.07	1.83	1.04	2.02	1.08	1.83	1.00	1.82	1.03	**1.90**	Disagreed
5	Does your information-seeking behaviour make you think negatively?	2.76	1.17	2.90	1.01	2.29	1.18	2.80	1.07	2.79	1.14	2.70	1.19	2.72	1.19	**2.71**	Agreed
6	Does your information-seeking behaviour make you hallucinate?	2.05	1.16	1.83	1.10	1.89	1.09	2.77	1.24	2.40	1.22	1.89	1.11	1.84	1.11	**2.10**	Disagreed
7	Does your information-seeking behaviour give you mood swings?	2,74	1.1	2.60	1.25	2.18	1.34	2.77	1.69	2.71	1.11	2.69	1.02	2.69	1.00	**2.23**	Disagreed
8	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?	2.03	1.12	1.86	1.07	2.07	1.14	1.80	1.05	1.97	1.08	1.89	1.09	1.87	1.10	**1.93**	Disagreed
9	Does your information-seeking behaviour make you lose interest in activities?	3.03	0.97	2.95	1.10	2.91	1.06	2.69	1.18	2.78	0.99	3.00	0.95	2.93	0.89	**2.90**	Agreed
	Weighted Mean	**2.04**	**0.46**	**2.39**	**0.11**	**2.21**	**0.29**	**2.34**	**0.16**	**2.55**	**0.05**	**2.33**	**0.22**	**2.37**	**0.13**		

Table 4.13 reveals the effect of health information-seeking behaviour on the mental health of diabetic patients in tertiary healthcare facilities in North Central Nigeria. Items with a mean score value greater or equal to 2.50 benchmark mean on a four-point Likert scale are considered positive about the statement made. Therefore, table 4.13 showed that only three items out of the nine items listed have a mean score greater than the 2.50 benchmark mean; these are: Item 2: Does your information seeking to make you feel depressed ($\bar{x}$ = 2.55, StD =1.11); Item 5: Does your information seeking behaviour made you think negatively?($\bar{x}$ = 2.71, StD =0.71) and Item 9: Does your information-seeking behaviour make you lose interest in activities? ($\bar{x}$= 2.90, StD =0.40). While items 1,3,4,6,7 and 8 have a means score value less than 2.50 benchmark mean on a four-point Likert scale.

4.3.8 :Research Question 8: What is the impact of health information–seeking behaviour on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

The respondents were asked to indicate the impact of health information-seeking behaviour on managing diabetes mellitus. Table 4.14 provides the following responses.

Table 4.14: Impact of Information Seeking Behaviour on the Management of Diabetes Mellitus

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	My health information-seeking behaviour has reduced the money I spend on drugs	1.97	1.00	2.62	1.17	2.91	1.18	2.71	1.10	2.67	1.20	2.57	1.22	2.57	1.16	**2.57**	Agreed
2	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in	2.68	0.93	2.50	1.15	2.58	1.16	2.69	1.21	2.83	1.05	2.24	0.95	2.52	1.04	**2.58**	Agreed
3	My health information-seeking behaviour reduced my visit to the healthcare centre	2.79	1.21	2.19	1.23	2.09	1.16	2.23	1.24	2.38	1.20	2.43	1.29	2.31	1.21	**2.35**	Disagreed
4	My health information-seeking behaviour has helped me to know the proper diet to take	2.63	1.26	2.62	1.32	2.93	1.25	2.74	1.25	2.62	1.18	2.69	1.30	2.80	1.25	**2.72**	Agreed
5	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus	2.76	1.05	2.45	1.13	2.09	1.08	1.86	1.06	2.59	1.20	2.30	1.20	2.31	1.21	**2.34**	Disagreed
6	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible	2.66	1.12	2.88	1.06	2.73	1.09	2.89	0.99	2.74	1.22	2.57	1.00	2.57	1.13	**2.72**	Agreed
7	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)	2.71	1.16	2.69	1.16	2.42	1.21	2.77	1.00	2.67	1.08	2.91	1.14	2.72	1.10	**2.70**	Agreed
8	My health information-seeking behaviour helps me to give first aid attention if there is a crisis	2.87	1.04	2.64	0.98	2.64	1.00	2.80	1.03	2.76	1.05	2.83	1.06	2.70	1.13	**2.75**	Agreed
	Weighted Mean	**2.63**	**0.13**	**2.57**	**0.07**	**2.55**	**0.05**	**2.59**	**0.09**	**2.66**	**0.16**	**2.58**	**0.08**	**2.56**	**0.06**		

Table 4.13 reveals the impact of health information-seeking behaviour on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria. Items with a mean score value greater or equal to 2.50 benchmark mean on a four-point Likert scale are considered positive about the statement made. Six of the eight items listed have a mean score greater than the benchmark mean. These items are Item 1: My health information-seeking behaviour has reduced the money I spend on drugs (= 2.57, StD =1.11); Item 2: My health information-seeking behaviour has helped me to know the right exercise that I can indulge in (= 2.58, StD =0.08); Item 4: My health information- seeking behaviour has helped me to know the proper diet to take (= 2.72, StD =0.22); Item 6: My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible (= 2.72, StD =0.22); Item 7: My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking (= 2.70, StD =0.20) and Item 8: My health information-seeking behaviour helps me to give first aid attention if there is a crisis (= 2.75, StD =0.25). While items 3 and 5 have a means score value, less than 2.50 benchmark mean on a four-point Likert scale.Also, looking at Table 4.14, it is observed that information-seeking behaviour and utilisation have a high impact on the management of diabetes mellitus in all the seven tertiary healthcare facilities studied.

4.3.9 : Research Question 9: What are the socio-economic determinants of health information seeking behaviour among patients in tertiary healthcare facilities in North Central, Nigeria?

The respondents were asked to indicate the socio-economic determinants of their health information seeking behaviours. Table 4.15 provides the following responses.

Table 4.15: Socio-economic Determinants of Diabetic Patients Health Information Seeking Behaviour

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	My age affects my health information-seeking behaviour	1.87	1.08	1.98	0.92	2.27	1.03	1.83	0.94	1.98	0.95	1.83	0.79	1.80	0.79	**1.94**	**Disagreed**
2	My educational status affects my health information-seeking behaviour	2.55	1.22	2.83	1.25	2.71	1.29	2.40	1.31	2.53	1.19	2.57	1.25	2.52	1.21	**2.59**	**Agreed**
3	My employment status affects my health information-seeking behaviour	1.97	1.50	2.57	1.21	2.27	1.18	2.29	1.32	2.05	1.03	1.89	1.09	2.05	1.09	**2.16**	**Disagreed**
4	My wealth quintile affects my health information-seeking behaviour	2.8	1.16	2.74	1.04	2.73	0.98	2.8	0.99	2.69	1.14	2.63	1.12	2.59	1.10	**2.71**	**Agreed**
5	My marital status affects my health information-seeking behaviour	1.74	1.00	1.69	0..95	1.80	1.04	2.00	1.14	2.17	1.13	1.81	0.97	2.02	1.16	**1.89**	**Disagreed**
6	My geographical location affects my health information-seeking behaviour	2.74	1.20	2.21	1.18	3.09	1.04	2.11	1.16	2.57	1.20	2.78	1.11	2.26	1.17	**2.54**	**Agreed**
7	My religion affects my health information-seeking behaviour	2.13	1.23	1.86	1.11	2.02	1.11	1.77	1.00	2.10	1.05	1.81	1.04	1.74	1.03	**1.92**	**Disagreed**
	Weighted Mean	**2.27**	**0.23**	**2.27**	**0.22**	**2.41**	**0.09**	**2.17**	**0.33**	**2.30**	**0.220**	**2.19**	**0.31**	**2.14**	**0.36**		

Table 4.15 reveals the socio-economic determinants of diabetic patients' health information-seeking behaviour in tertiary healthcare facilities in North Central Nigeria. Items with a mean score value greater or equal to 2.50 benchmark mean on a four-point Likert scale were considered to be positive about the statement made. Therefore, threeitems have a mean score value equal or greater than the benchmark mean. These were: item2: My educational status affects my health information-seeking behaviour (= 2.59, StD=0.19); item 4: My wealth quintile affects my health information-seeking behaviour(= 2.71, StD=0.21) and item 6: My geographical location affects my health information- seeking behaviour (= 2.54, StD=0.04); While the other items on the list have a mean value lower than the benchmark mean of 2.50 on a four-point Liker scale. These were: items 1: My age affects my health information-seeking behaviour (= 1.94, StD=0.04); item 3: My employment status affects my health information-seeking behaviour (= 2.16, StD=0.34); item 5: My marital status affects my health information-seeking behaviour (= 1.89, StD=0.61) and item 7: My religion affects my health information-seeking behaviour(= 1.92, StD=0.58). Furthermore, Table 4.15 revealed that none of the seven tertiary healthcare facilities studied have a mean score that equals the benchmark mean of 2.50 on afour-point Likert scale.

4.3.10 : What were the challenges encountered by diabetic patients using health information in tertiary healthcare facilities in North Central, Nigeria?

The respondents were asked to indicate the challenges encountered in using health information to manage diabetes mellitus. Table 4.16 provides the following responses.

Table 4.16: Challenges Encountered in Using Health Information by Diabetic Patients

S/N	Statement	FMC BIDA (38)		FMC MAK (42)		FMC LKJ (46)		FMC KEF (35)		UITH (58)		JUTH (46)		UATH (61)		W.M	Dec.
		$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD	$\bar{X}$	StD		
1	Lack of time	2.16	1.15	2.21	1.18	2.29	1.14	1.18	1.01	2.16	1.06	2.04	1.16	2.10	1.14	**2.02**	**Disagreed**
2	High cost of data subscription	2.50	1.25	2.90	1.07	2.84	1.06	2.80	1.16	2.69	1.17	1.93	1.08	2.00	1.03	**2.52**	**Agreed**
3	Poor Internet connectivity	2.18	0.98	1.74	0.73	2.78	1.08	2.00	0.97	2.55	1.14	2.62	1.18	2.52	1.18	**2.34**	**Disagreed**
4	Data smog (Information overload)	1.87	1.21	2.67	1.20	2.62	1.17	2.77	1.09	2.76	1.16	2.50	1.32	2.74	1.28	**2.56**	**Agreed**
5	Lack of adequate diabetic programs on radio and television stations	2.53	1.22	2.71	1.24	2.56	1.09	2.15	1.14	2.22	1.11	2.59	1.20	2.70	1.16	**2.50**	**Agreed**
6	Lack of adequate hard copy materials	2.45	1.27	2.57	1.23	2.58	1.16	2.74	1.17	2.90	1.07	2.80	1.20	2.85	1.15	**2.70**	**Agreed**
7	Lack of computer literacy	2.55	1.20	1.86	1.02	2.13	1.10	2.43	1.17	2.19	1.05	1.83	0.90	2.08	0.98	**2.15**	**Disagreed**
8	Psychological issues	2.71	1.60	2.36	1.16	2.09	1.84	2.00	1.14	2.76	0.96	2.72	1.03	2.51	1.12	**2.45**	**Disagreed**
9	Lack of understanding information due to scientific and medical terms used	2.82	1.29	2.43	1.34	2.64	1.21	2.71	1.29	2.43	1.19	2.50	1.34	2.57	1.31	**2.59**	**Agreed**
10	Problems in the doctor-patient relationship	2.13	1.23	2.07	1.07	2.04	1.04	2.09	1.17	2.38	1.07	1.85	1.14	2.08	1.08	**2.09**	**Disagreed**
	Weighted Mean	**2.39**	**0.11**	**2.35**	**0.15**	**2.46**	**0.13**	**2.30**	**0.20**	**2.50**	**0.02**	**2.38**	**0.22**	**2.42**	**0.08**		

Table 4.16 reveals the challenges encountered by diabetic patients in health information for the management of diabetes mellitus in tertiary healthcare facilities in North Central,Nigeria. Items with a mean score value greater or equal to 2.50 bench mark mean on a four point Likert scale were considered to be positive about the statement made. These were item 2: High cost of data subscription (= 2.52, StD=0.02); item 4: Data smog (Information overload) (= 2.56, StD=0.06); item 5: Lack of adequate diabetic programson radio and television stations (= 2.50, StD=0.05); item 6: Lack of adequate hard copy materials (= 2.70, StD=0.20) and item 9: Lack of understanding information due to scientific and medical terms used (= 2.59, StD=0.19) respectively. Meanwhile, the other items have a mean score less than the benchmark mean of 2.50 on a four-point Likert scale.These include: item 1: Lack of time (= 2.02, StD=0.38); item 3: Lack of internet connectivity (= 2.34, StD=0.26); item 7: Lack of computer literacy (= 2.15, StD=0.35); item 8: Psychological issues (= 2.45, StD=0.05) and item 10: Problems in the doctor- patient relationship (= 2.09, StD=0.31).

4.8 Hypotheses Testing

H_{o1}. There is no significant influence of health information seeking behaviour on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

Table 4. 17: Model Summary of Regression Analysis of Health Information Seeking Behaviour and the Management of Diabetes Mellitus

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.357	0.127	0.126	1.011

a. Predictors: (Constant), Health Information Seeking Behaviour

Table 4.18: ANOVA Model of Regression Analysis of Health Information Seeking Behaviour and the Management of Diabetes Mellitus

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	54.091	1	54.091	52.823	0.000
Residual	338.051	330	1.024		
Total	392.142	331			

a. Dependent Variable: Management of Diabetes Mellitus
b. Predictors: (Constant), Health Information Seeking Behaviour

Table 4.17 and Table 4.18 revealed the significant influence of health information-seeking behaviour on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria. The regression results with R = 0.357, R square = 0.127, and Adjusted R square = 0.126 in Table 4.17 and (F (1,330) = 52.823 in Table 4.18, which was significant at a 0.05 level of significance (0.000 = P<0.05). R = 0.357 showed the correlation between the independent variable (health information-seeking behaviour) and the dependent variable (management of diabetes). With R square equal to 0.127, the result indicated that health information seeking behaviour accounted for 13% of the variability of managing diabetes mellitus in tertiary healthcare facilities in North Central Nigeria.

Therefore, with p<0.05, the null hypothesis that there is no significant influence of health information seeking behaviour on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria was rejected. This implies a significant

influence of health information-seeking behaviour on managing diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria.

H_{o2}. There is no significant influence of health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria.

Table 4. 19: Model Summary of Regression Analysis of Health Information Utilisation and the Management of Diabetes Mellitus

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.595	0.354	0.353	0.995

a. Predictors: (Constant), Health Information Utilisation

Table 4.20: ANOVA Model of Regression Analysis of Health Information Utilisation and the Management of Diabetes Mellitus

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	65.256	1	65.256	65.849	.004
Residual	326.886	330	0.991		
Total	392.142	331			

a. Dependent Variable: Management of Diabetes Mellitus
b. Predictors: (Constant), Health Information Utilisation

Table 4.19 and Table 4.20 revealed the significant influence of health information utilisation on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria. The regression results with R = 0.595, R square = 0.354, Adjusted R square = 0.353 in Table 4.19, and (F (1,330) = 65.256 in Table 4.20

which is significant at a 0.05 level of significance (0.004 = P<0.05). R = 0.595 showed the correlation between the independent variable (health information utilisation) and the dependent variable (management of diabetes). With R square equal to 0.354, the result indicated that health information utilisation accounted for 35% of the variability of explaining the management of diabetes mellitus in tertiary healthcare facilities in North Central Nigeria.

Therefore, with p<0.05, the null hypothesis that there is no significant influence of health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria was rejected. This implies that health informationutilization has a significant influence on managing diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria.

H_{o3}. There is no significant influence of health information seeking behaviour, utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

Table 4. 21: Model Summary of Regression Analysis of Health Information Seeking Behaviour, Health Information Utilisation and the Management of Diabetes Mellitus

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.638	0.407	0.406	0.926

a. Predictors: (Constant), Health Information Seeking Behaviour, Health Information Utilisation

Table 4.22: ANOVA Model of Regression Analysis of Health Information Seeking Beahviour, Health Information Utilisation and Management of Diabetes Mellitus

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	61.442	2	30.721	36.015	.001
Residual	280.656	329	0.853		
Total	342.098	331			

a. Dependent Variable: Management of Diabetes Mellitus
b. Predictors: (Constant), Health Information Seeking Behaviour, Health Information Utilisation

Table 4.21 and Table 4.22 revealed the significant influence of health information-seeking behaviour and health information utilisation on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria. The regression results with R = 0.638, R square = 0.407, Adjusted R square = 0.406 in Table 4.21, and ($F_{(2,329)} = 36.015$ in Table 4.22, which was significant at a 0.05 level of significance ($0.001 = P<0.05$). R = 0.638 showed the correlation between the independent variables (health information-seeking behaviour and health information utilisation) and the dependent variable (diabetes management). With R square equal to 0.407, the result indicated that health information-seeking behaviour and health information utilisation accounted for 41% in variability of explaining the management of diabetes mellitus in tertiary healthcare facilities in North Central Nigeria.

Therefore, with $p<0.05$, the null hypothesis that there is no significant influence of health information-seeking behaviour and health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria was rejected. This implies that there is a significant influence of health information-seeking behaviour and

health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central Nigeria.

H_{o4}. There is no significant influence of frequency of use, health information literacy, and socio-economic determinants on the management of diabetes mellitus in tertiary healthcare facilities in North Central Nigeria

Table 4. 23: Model Summary of Regression Analysis of Frequency of Use, Health Information Literacy, Socio-Economic Determinant and Management of Diabetes Mellitus

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.678	0.459	0.458	1.006

a. Predictors: (Constant), Frequency of Use, Health Information Literacy and Socio-economic Determinant

Table 4.24: ANOVA Regression Analysis of Frequency of Use, Health Information Literacy, Socio-Economic Determinant and Management of Diabetes Mellitus

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	46.133	3	15.378	15.181	.001
Residual	332.249	328	1.013		
Total	378.382	331			

a. Dependent Variable: Management of Diabetes Mellitus
b. Predictors: (Constant), Frequency of Use, Health Information Literacy and Socio-economic Determinant

Table 4.23 and Table 4.24 revealed the significant influence of frequency of use, health information literacy, and socio-economic determinants on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria. The

regression results with R = 0.678, R square = 0.459, Adjusted R square = 0.458 in Table 4.23, and (F (3,328) = 15.181 in Table 4.24, which was significant at a 0.05 level of significance (0.001 = P<0.05). R = 0.678 showed the correlation between the frequency of use, health information literacy, and socio-economic determinants and management ofdiabetes. With the R square equal to 0.459, the result indicated that frequency of use, healthinformation literacy, and socio-economic determinants accounted for 46% of the variabilityof explaining the management of diabetes mellitus in tertiary healthcare facilities in North Central Nigeria.

Therefore, with p<0.05, the null hypothesis that there is no significant influence of frequency of use, health information literacy, and socio-economic determinants on the management of diabetes mellitus in tertiary healthcare facilities in North Central Nigeria, was rejected. This implies that frequency of use, health information literacy, and socioeconomic determinants significantly influence the management of diabetes mellitus in tertiary healthcare facilities in North Central Nigeria.

4.4 Summary of the Findings

The following findings emanated from the study based on the research questions answered.

1. The health information sources used for the management of diabetes by patients in tertiary health facilities in North Central Nigeria are; booklets, brochures, leaflets from clinics or health professionals, magazines/newspapers/newsmagazines, Internet, WhatsApp groups, Facebook pages/Facebook groups, health professionals, families and friends and other patients with diabetes.

2. The health information needs of diabetic patients in tertiary healthcare facilities in North Central Nigeria are on what diabetes is, the symptoms of diabetes, the complications of diabetes, the proper diet for people with diabetes, and the right exercise for diabetic patients.

3. The study revealed that diabetic patients in tertiary healthcare facilities seek health information for managing diabetes from booklets, brochures, leaflets from clinics or health professionals, the Internet, WhatsApp groups, Facebook pages/Facebook groups, health professionals, and families and friends.

4. The study revealed that the frequency of use of health information for managing diabetes from booklets, brochures, leaflets from clinics or health professionals, the Internet, WhatsApp groups, Facebook pages/Facebook groups, health professionals, and families and friends is high.

5. The health information literacy skills for managing diabetes mellitus are computer and Internet navigation skills, sharing of health information across various platforms, ability to identify health information sources, ability to recognise health information needs, and how to use health information to make good decisions.

6. The respondents are satisfied in the use of health information from the Internet, Facebook, health professionals, and family and friends for managing diabetes mellitus.

7. The effect of health information-seeking behaviour is that it makes the respondents feel depressed, think negatively, and lose interest in activities.

8. The health information utilisation of respondents has helped in the management of diabetes mellitus by reducing the money spent on drugs, to know the right exercise to indulge in, knowing the proper diet to take, keeping blood glucose levels near normal as possible, knowing the habits to quit (e.g., smoking and drinking) and to give first aid attention if there is a crisis.

9. The socio-economic determinants affecting health information utilisation formanaging diabetes mellitus in the tertiary healthcare facilities studied were educational status, wealth quintile, and geographical location.

10. The challenges encountered by diabetic patients studied in their health information-seeking behaviour and utilisation for the management of diabetes mellitus were: the high cost of data subscription, data smog (Information overload), lack of adequate diabetic programs on radio and television stations, lack of adequate hard copy materials and lack of understanding information due to scientific and medical terms used.

11. Health information-seeking behaviour has a significant influence on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria.

12. The health information utilisation of diabetic patients in tertiary healthcare facilities in North Central, Nigeria significantly influences the management of diabetes mellitus.

13. Health information seeking behaviour and health information utilisation significantly influence the management of diabetes mellitus in tertiary healthcare facilities inNorth Central, Nigeria.

14. Frequency of use, health information literacy, and socioeconomic determinants significantly influence the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria.

4.5 Discussion of the Findings

Based on the findings derived from the study's results, the following were discussed.

4.5.1 Research Question 1: What are the sources of health information used by diabetic patients in tertiary healthcare facilities in North Central Nigeria?

The result of the analysis from Table 4.7 revealed that the major health information sources used for the management of diabetes by patients in tertiary health facilities in North Central Nigeria are booklets, brochures, leaflets from clinics or health professionals, magazines/newspapers, Internet, WhatsApp group, Facebook pages/Facebook group, health professionals, families and friends and other patients with diabetes. These could be attributed to, among other facts, access to these health information sources; during the data collection for the study, the researcher observed that each time diabetic patients come for their scheduled appointments, they always go home with booklets, brochures, and leaflets from the clinic. Furthermore, the online resources from the Internet, WhatsApp, and Facebook, which are mostly used, could also be connected to the satisfaction that the respondents derived from these sources of information and cost-effectiveness. These findings agree with the finding of Kostagiolas *et al.* (2018), which revealed that digital sources (such as online scientific databases and search engines) were the most popular information sources used by diabetes physicians. However, the difference between this study and the current research is the population used. In addition, DM physicians inKostagiolas *et al.* (2018) research were mostly satisfied with using digital information

sources, whereas interpersonal and conventional sources were not considered equally important in their information satisfaction paths. Overall, it can be observed that only one of the high information satisfaction paths includes a combination of digital information sources, whereas interpersonal and conventional sources were not considered equally important in their information satisfaction paths.

Similarly, in Mengiste *et al.* (2021), when participants were asked about their primary sources, 156 (88.6%) of them used health professionals as the primary source to obtain diabetes-related information. Other sources of health information consulted included books, the internet, brochures, mass media, family, friends, and magazines or newspapers. The qualitative study results showed that health professionals were the primary source of diabetes information among patients with diabetes. This study indicated that out of the total participants, the majority, 417 (98.6%), of patients with diabetes have a high level of trust in health professionals, followed by books, 376 (88.9%), and mass media, 312 (73.7%). The results of the qualitative study show that most patients with diabetes have greater trust in health professionals than in other sources of diabetes information.

This current research also corroborates the study of Kalantzi *et al.* (2015), who examined diabetes-related sources of information and revealed that the majority of them (94.6%) reported they relied on their physicians as their main source of information (especially for patients with lower education, lower income, and worse DM control), followed by the ophthalmologist (31.5% of participants, especially for males, with longer duration of diabetes mellitus). The broadcast media, i.e. television and radio, were ranked third in importance (15.3% of participants, especially for males of younger age, higher education and better DM control). Relatives/friends (7.8%), books (6.4%), nurses (1.5%), pharmacists

(1.0%), and other information sources were ranked much lower in importance. It is also of note that, although “Internet usage” as a whole was limited (only 5.4% of the participants considered it as an important source of information for DM), in the younger age group of patients (<40 years), which was a minority of the patients that took part in this study (11.3%), the internet was considered as a quite important information source (30.4% vs. 2.2% for those >40 years old). Apart from age ($p < 0.001$), Internet usage as an important information source was associated with having Type 1 DM, having higher education and income, lower duration of the disease, being followed up in the Diabetes Clinic vs. the Diabetic Foot Clinic, and having better DM control.

Finally, the findings from Table 4.3.1 aligned with the study of Iorver (2020), who revealed that the sources of accessing health information by diabetic patients in Benue state are medical practitioners, nurses, other health workers, Television programmes and Radio programmes with percentage values of Yes above 50% were considered the sources of accessing health information by diabetic patients.

4.5.2. Research Question 2: What is the information needs of diabetic patients in tertiary healthcare facilities in North Central Nigeria?

The findings from Table 4.8 revealed that the major health information needs of diabetic patients in tertiary healthcare facilities in North Central Nigeria are the need to know what diabetes is; this was a major health information need of patients with diabetes mellitus across all the tertiary healthcare facilities studied. This could be because the issue can be tackled when an individual fully understands a situation. Also, another health information need of the respondents is to know the symptoms of diabetes, the complications of diabetes, information on the proper diet for people with diabetes, and information on the right

exercise for diabetes patients. From this health information about the population, it could be inferred that the respondents have these dire needs so they can know how to manage this ailment. The findings of this study corroborated the study of Crangle *et al.* (2018), who explored patient information needs in type 2 diabetes and revealed that the information needs of the respondents were to know the risks associated with diabetes mellitus and how to manage it. Similarly, Wang *et al.* (2020), in their study of the health information needs regarding diabetes mellitus in China: an internet-based analysis, revealed that the information needs of patients with diabetes are on diagnosis, treatment, lifestyle, complication, maternity-related, and the treatment and complications of diabetes. Equally, Kalantzi *et al.* (2015), in their study of the information-seeking behaviour of patients with diabetes mellitus: a cross-sectional study in an outpatient clinic of a university-affiliated hospital in Athens, Greece, revealed that principal information considered as the most important by the majority of them are; "what is the proper diet for diabetes", which was associated with younger age "what are the complications of diabetes, what is the right exercise for diabetes, what are the measures taken to avoid foot complications in diabetes mellitus and the symptoms of hypoglycemia.

4.5.3. Research Question 3: What is the health information-seeking behaviour of diabetic patients in tertiary healthcare facilities in North Central Nigeria?

Furthermore, the analysis from Table 4.9 revealed that diabetic patients in the healthfacilities studied sought health information from booklets, brochures, and leaflets from clinics or health professionals, Internet, WhatsApp, Facebook pages/Facebook groups, health professionals, broadcasting media, family and friends for managing diabetes. Interviewing some of the respondents during the study divulged that their choice of the

Internet is because that is where everybody visits to search for information, and this is also connected to why they join WhatsApp and Facebook groups so they can be kept abreast of health information that will help them in managing their ailment. The health information-seeking behaviour of patients with diabetes mellitus in the studied health facilities can also be attributed to their trust in the health professionals because they have been trained and have experience managing diabetes. This finding also aligns with a previous study by Mengiste *et al.* (2021), which revealed that diabetic patients sought diabetes information purposely from health professionals. Compared to other sources of diabetes information, health professionals provide easily understandable and clear information about diabetes, and also health professionals are easily accessible in our village. Other respondents reported that they sought information about diabetes purposely from health professionals in the past because, compared to other sources of information, health professionals are highly educated and trained and have good trust in them. This current study also confirms some of the findings of Silvanus *et al.* (2022), who examined the factors influencing health-seeking behaviour among persons with diabetes attending urban healthcare settings and revealedthat the respondents in the study visit clinics when seeking health information. However, Silvanus *et al.* (2022) concluded that diabetes information-seeking is a well-documented behaviour, and diabetes-related knowledge is known to improve after diagnosis. People living with diabetes in the study area often consult family members, friends, and healthcare professionals for information related to diabetes care and support. Younger persons and those with higher education seek information more often online. However, most PWDs continue to perceive physicians as an important source of information regarding diabetes- related complications and therapy.

4.5.4 Research Question 4: What is the frequency of usage of health information for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria?

Analysis from the study revealed that the health information sources frequently used for diabetes management are booklets, brochures, leaflets from clinics or health professionals, the Internet, WhatsApp groups, Facebook pages/Facebook groups, health professionals, and families and friends (Table 4.10). The study further showed that diabetic patients in tertiary healthcare facilities had a low frequency of health information usage. This could be due to the perception of already having some information about diabetes, lack of awareness on information use, having lower educational status, far distance from health institutions, and difficulties in accessing information sources. Low usage could also be attributed to the low information literacy of the respondents or lack of awareness of the available health information sources. However, Das *et al.* (2022), in a study in Bangladesh revealed that the odds of diabetes information seeking among urban patients with diabetes were four times higher than for patients residing in rural areas. This could be due to their higher educational status (46.6%) and adequate level of health literacy (57.7%), compared to the lack of adequate infrastructure (78.4%) and shortage of healthcare providers (81.1%) in rural areas of the country.

Similarly, the qualitative study shows that this is due to the distance from health institutions and low accessibility of diabetes information sources, such as books, magazines, the Internet, and mass media, in the country's rural areas. Mengiste *et al.* (2021), on thefrequency of information seeking, revealed that about 36.3% of the patients with diabetes sought diabetes-related information monthly. However, only 1.7% of them, especially

males and highly educated patients with diabetes, sought diabetes-related information every day. Also, Kalantzi *et al.* (2015) who examined the diabetes-related sources of information and revealed that the majority of them (94.6%) reported that the questionnaire specifically explored the reported frequency of internet usage as an information source for DM. Most patients (71.9%) reported that they never used the Internet. In comparison, in total, 91.1% of the participants reported they used the internet at a frequency of once a month or less to seek information about diabetes mellitus.

The current study also equally corroborates the findings of Iorver (2020), who carried out an assessment of utilisation of health information resources by diabetic patients in Benue State, Nigeria, and revealed the extent of utilisation of health information resources by diabetic patients in Benue State that some items listed for the study are highly utilized such as Treatment fact sheet, Medical posters, Medical billboards, Medical pamphlets, Medical videos. While, Medical books, Medical journals, Medical newspapers, Medical magazines, Medical brochures, Medical newsletters, Medical tapes, Medical cassettes, Medicus, Medical firms, Medical microform, Clinical Trails.gov, and Medical dictionaries all have a mean score lower than 2.50 benchmark means on a 4 point Likert scale. Iorver (2020), however, deduced from his findings that the extent to which diabetic patients utilize health information resources in Benue State is low.

4.5.5 Research Question 5: What is the health information literacy skill for the management of diabetes mellitus by diabetic patients in tertiary health facilities in North Central, Nigeria?

The analysis from Table 4.11 revealed that the health information literacy skills for the management of diabetes mellitus are computer and Internet navigation skills, sharing of health information across various platforms, ability to identify health information sources, ability to recognise health information needs and how to use health information to make good decisions. These findings could be due to the increasing reliance on technology; with the advent of the internet and digital devices, people have become more dependent on technology for information. This has made computer and internet navigation skills crucial for accessing health information about diabetes management. Another reason could be the abundance of health information. There is an avalanche of health information available online, which can be overwhelming for people with diabetes. Therefore, identifying and evaluating health information sources is essential for individuals to access reliable and trustworthy information. Also, the findings in the study could result from changes incommunication patterns; with the rise of social media and other digital platforms, people can easily share health information and experiences with others. Therefore, the ability to share health information across various platforms is essential for individuals with diabetes to learn from others' experiences and stay updated on new developments. Finally, self- management is important in the management of diabetes mellitus. It requires active involvement and decision-making by individuals. Therefore, recognising health information needs and using health information to make good decisions is essential for individuals to manage their condition effectively.

The finding from Table 4.11 shows that health information literacy skills play a vital role in empowering individuals with diabetes to manage their condition effectively. Computer and Internet navigation skills are vital for individuals with diabetes to access and utilize health

information effectively. The internet is a rich source of health information, including educational materials, research articles, and support forums. Individuals with diabetes need the skills to search for and access relevant health information online. The current study, however, agrees with the findings of Kim *et al*. (2020), who investigated the health literacy and outcomes of a community-based self-help intervention: a case of Korean Americans with type 2 diabetes. Kim *et al.* (2020) revealed that individuals with diabetes with higher computer and internet navigation skills had better glycemic control than those with lower skills.

The current study's respondents indicated that they could share information across various platforms ($\bar{x}$ 2.50, StD = 0.50). Sharing health information across various platforms is also an essential health information literacy skill required for managing diabetes mellitus. Individuals with diabetes may need to share health information with healthcare providers, family members, and support groups. The ability to share health information throughvarious platforms, including email, social media, and patient portals, is critical. According to a study by Tiase *et al.* (2020), using patient portals to share health information improved glycemic control among individuals with diabetes.

Diabetic patients in the tertiary health facilities studied in North-central Nigeria revealed they have skills in identifying health information sources (= $\bar{x}$63, StD = 0.31). This could be attributed to their education and exposure level; identifying health information sources isan essential health information literacy skill required for managing diabetes mellitus. With the proliferation of health information sources, including websites, blogs, and social media, it is essential to identify reliable and credible sources of health information; posing thisskill is likely to help them manage their ailment better. This finding also corroborates with

that of Zhang *et al.* (2020), who examined the self-care and health-information-seeking behaviours of diabetic patients in Singapore, Zhang *et al.* (2020) according to their study, the majority of the respondents indicated that they could figure out where to get diabetes- related information, the study further showed that individuals with diabetes who had higher health information literacy skills had better knowledge and awareness of reliable sources ofhealth information.

Another health information literacy skill possessed by diabetic patients studied in North-central Nigeria, as shown in Table 4.11, is the ability to recognize their information needs. The ability to recognize health information needs is also critical for individuals withdiabetes to manage their condition effectively. Individuals with diabetes may have diverse information needs, including information on medication management, dietary guidelines, and lifestyle modifications. The ability to recognize these information needs and search for relevant information is essential. According to a study by Aminuddin *et al*. (2021), individuals with diabetes with higher health information literacy skills had better self-care practices.

Finally, using health information to make good decisions is a crucial health information literacy skill required for managing diabetes mellitus, which the population studied also possesses. Diabetes mellitus patients must understand how to interpret health information effectively and apply it to their self-care practices. These findings agree with that of Shin and Lee (2018), who examined a simple mediation model of the relationships among health literacy, empowerment, and self-care behaviours while controlling for the covariate of diabetes education in three community health centers in Gyeonggi-do, South Korea. The study revealed that individuals with diabetes possess health information literacy skills ($\bar{X}$=

2.72, StD = 0.80); the study revealed that respondents with higher health information literacy skills had better self-care behaviours and improved glycemic control. In conclusion, health information literacy skills are vital for managing diabetes mellitus.Computer and internet navigation skills, sharing of health information across various platforms, the ability to identify health information sources, the ability to recognize health information needs, and the ability to use health information to make good decisions are essential skills required for effective diabetes management and posed by the population studied. Health professionals should prioritize educating individuals with diabetes on these essential health information literacy skills to improve self-care practices and overall health outcomes.

4.5.6. Research Question 6: What is the level of satisfaction derived from the use of health information by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

Table 4.12 revealed that respondents are satisfied with using health information from the Internet, Facebook, health professionals, and family and friends to manage diabetes mellitus. These findings could be connected to the fact that the Internet and social media platforms, such as Facebook, provide a convenient and easily accessible way for individuals to obtain health information anytime and anywhere. Facebook also provides a means for diabetic patients to connect with others who share their condition and access to health information. This may be particularly beneficial for individuals with busy schedules or those who live in remote areas. The Internet and social media platforms also provide a vast array of health information related to diabetes mellitus, including information on

management, treatment, and prevention. This allows individuals to explore various options and make informed decisions about their health. Seeking health information from family and friends may provide individuals with diabetes mellitus with a sense of social support, which can help them manage the emotional and psychological challenges of living with a chronic condition. The satisfaction obtained in using health information from health professionals, such as doctors, nurses, and diabetes educators, could be because diabetic patients have access to expert guidance and advice, which can help them make more informed decisions about their health and improve their overall health outcomes.

The findings from the current study agree with that of Zhang *et al.* (2020) in a study of the factors influencing patients' intentions to use diabetes management apps based on an extended unified theory of acceptance and use of the technology model: a web-based survey. The co-authors revealed that the internet has become a popular source of health information for individuals with diabetes. Individuals with diabetes who use the internet for health information reported high levels of satisfaction with the information they received. The study also found that using the internet for health information was associated with increased knowledge about diabetes and improved self-care practices. Similarly, Othman *etal.* (2022), who examined the perspectives of persons with type 2 diabetes toward diabetes self-management, revealed that one source of health information that has become increasingly popular among diabetic patients is the internet. The Internet provides easy access to health information, including diet and exercise tips, medication information, and self-care strategies. Othman *et al.* (2022) found that diabetic patients who used the Internetto manage their condition reported high levels of satisfaction with the information they found.

Khoong *et al.* (2020) revealed in a cross-sectional survey of the use of technology for communicating with clinicians or seeking health information in a multilingual urban cohort that Facebook is another social media platform that has gained popularity among individuals with diabetes as a source of health information. The co-authors further revealed that individuals with diabetes who used Facebook for health information reported high levels of satisfaction with the information they received. Using Facebook for health information was associated with increased knowledge about diabetes and improved self- care practices.

The current study on the satisfaction derived from the use of health information from health professionals is in sync with that of Dao *et al.* (2019) in a qualitative study of the factors influencing self-management in patients with type 2 diabetes in general practice in Australia who revealed that individuals with diabetes who received health information from their healthcare provider reported high levels of satisfaction with the information they received. The study also found that using health professionals as a source of health information was associated with improved self-care practices and better glycemic control. A study by Messenger *et al.* (2019) on the role of informal caregivers in managing diabetic foot ulcers was carried out in Kuwait. Found that individuals with diabetes who received health information from their family and friends reported high levels of satisfaction withthe information they received. The study also found that using family and friends as a source of health information was associated with improved self-care practices and better glycemic control.

4.5.7. Research Question 7: What is the effect of health information-seeking behaviour on the mental health of diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

Analysis from Table 4.13 revealed that the health information-seeking behaviour for the management of diabetes mellitus makes the respondents feel depressed, think negatively, and lose interest in activities. These feelings could be because, what the diabetic patients studied may have made them have a fear of complications. Diabetes can lead to several complications if not managed properly, such as nerve damage, kidney disease, and eye problems. Learning about these potential complications can be distressing and may cause individuals to worry about their future health. Another reason could be overwhelming Information: The vast amount of health information available can be overwhelming, leading to confusion, anxiety, and stress. This can lead to negative thoughts and emotions, including depression and loss of interest in activities. Also, managing diabetes often requires significant lifestyle changes, such as changing one's diet, increasing physicalactivity, and monitoring blood sugar levels. These changes can be challenging to implement and maintain, which can cause frustration and feelings of hopelessness. Moreover, diabetes is still stigmatised in many societies, and individuals with the condition may feel ashamed or embarrassed about their diagnosis. Seeking health information and utilizing it for diabetes management may exacerbate these feelings, leading to a negative impact on mental health.

The findings from the current study align with that of Jean (2017), who explored the factors motivating, demotivating, or impeding information seeking and use by people with type 2 diabetes: a call to work toward preventing, identifying, and addressing incognizance

revealed that individuals with diabetes mellitus who engage in health information seeking behaviour may experience negative emotions such as anxiety, depression, and frustration. These negative emotions can result from difficulty understanding the information, fear of complications, and uncertainty about the future.

Similarly, Rasoul *et al*. (2019), in their study of the effect of self-management education through weblogs on the quality of life of diabetic patients, found that individuals with diabetes mellitus who utilized health information reported high levels of stress, anxiety, and depression. The study also found that using health information was associated with reduced quality of life and decreased social and physical activity. According to a study by Malinaki and Gardikiotis (2023), individuals with diabetes mellitus who experience negative emotions related to the management of their condition may lose interest in activities such asexercise, social activities, and hobbies. This loss of interest can negatively affect theindividual's quality of life and overall well-being. In a collaborative study carried out in 14 countries on the prevalence and correlates of depressive disorders in people with Type 2 diabetes: results from the International Prevalence and Treatment of Diabetes and Depression (INTERPRET-DD) Lloyd *et al*. (2018), diabetic patients who frequently searched for health information on the internet reported higher levels of depressive symptoms. The study suggests that increased access to health information can lead to feelings of overwhelm and anxiety, which in turn can contribute to depression. Moreover, health information-seeking behaviour and utilisation among diabetic patients can make them think negatively about their condition.

According to a study by Knowles *et al.* (2020), diabetic patients who frequently searched for health information on the Internet had higher levels of health anxiety and negative illness perceptions. The study suggests that increased access to health information can lead to a greater focus on negative aspects of the condition, which can contribute to negative thinking. While exploring the relationships between illness perceptions, self-efficacy, coping strategies, psychological distress, and quality of life in a cohort of adults with diabetes mellitus, Kadariya and Aro (2018) discovered that diabetic patients who frequentlysearched for health information on the internet reported lower levels of physical activity. The study suggests that the increased focus on the condition can lead to a neglect of other activities, which can contribute to a loss of interest. It is important to note that the potential negative consequences of health information-seeking behaviour and utilisation among diabetic patients can vary depending on the individual. Some individuals can effectively manage the increased access to health information, while others may struggle with the potential negative consequences.

The current study, however, disagrees with the findings of Wang *et al.* (2020) in a study of health information seeking, source trust, and depression: A moderated mediation model revealed that patients who frequently searched for health information on the internet had better mental health outcomes, including reduced depression and anxiety symptoms. The study suggests increased access to health information can help patients feel empowered and control their condition, leading to positive mental health outcomes. According to Lee *et al.* (2018), diabetic patients who frequently searched for health information on the Internet had better self-care behaviours, including exercise and diet management. The study suggests that increased access to health information can provide patients with the knowledge and

resources needed to make positive lifestyle changes.

Finney-Rutten *et al.* (2016) revealed that health information-seeking behaviour and utilisation among diabetic patients could increase adherence to medication and treatment regimens. The findings of the co-authors revealed that diabetic patients who frequently searched for health information on the Internet had higher medication adherence rates. The study suggests that increased access to health information can help patients better understand the importance of medication and treatment adherence.

4.5.8 Research Question 8: What is the impact of health information utilisation on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

Table 4.14 of the analysis showed that the health information utilisation of respondents has helped in the management of diabetes mellitus by reducing the money spent on drugs, to know the right exercise to indulge in, knowing the proper diet to take, keeping blood glucose level as near normal as possible, to know the habits to quit (e.g., smoking and drinking) and to give first aid attention if there is a crisis. These findings could be as aresult of one of the following: increased awareness; by seeking health information, individuals become more aware of the consequences of uncontrolled diabetes, including therisk of complications such as blindness, kidney failure, and nerve damage. This increased awareness motivates them to take steps to manage their diabetes effectively. Also, health information-seeking behaviour and utilisation enable individuals to access accurate and reliable information on managing diabetes effectively. This knowledge empowers them to make informed decisions about their health and take appropriate actions to manage their

condition. Another reason for these findings could be better adherence to treatment. The information obtained through health information seeking helps individuals to understand the importance of adhering to their diabetes treatment plan. This includes taking medication as prescribed, monitoring blood glucose levels regularly, following a healthy diet, and engaging in physical activity. By managing diabetes effectively, individuals can reduce the money spent on drugs and avoid costly complications associated with uncontrolled diabetes. This helps reduce the healthcare system's burden and improve the quality of life for people with diabetes.

The current study's findings corroborate with that of Sarfo *et al.* (2019) which revealed that one of the benefits of health information-seeking behaviour and utilisation among diabetic patients is the reduction in the amount of money spent on drugs. According to a study by Sarfo *et al.* (2019), diabetic patients who seek health information and utilize it effectively have better blood glucose control and require less medication, reducing medication costs. Similarly, Soroya *et al. (2020),* affirmed that proper health information-seeking behaviour and utilisation for managing diabetes mellitus had been shown to help diabetic patients know the right exercise to engage in, which is essential. Soroya *et al.* (2018) discovered that diabetic patients with regular physical activity had better blood glucose control and reduced the risk of complications. Health information-seeking behaviour and utilisation canprovide diabetic patients with information on the appropriate exercise regime for their condition, leading to better outcomes.

Furthermore, health information-seeking behaviour and utilisation for the management of diabetes, according to Sami *et al.* (2017), help diabetic patients know the proper diet to

take, which is essential in the management of diabetes mellitus. Sami *et al*. (2017) revealed that diabetic patients who follow a balanced diet can achieve better blood glucose control and reduce the risk of complications. Health information-seeking behaviour and utilisation can provide diabetic patients with information on the appropriate diet for their condition, leading to better outcomes. The Study of Butayeva *et al.* (2018) also aligns with the current study, which revealed that health information-seeking behaviour and utilisation could help diabetic patients keep their blood glucose level as near normal as possible. According to Butayeva *et al*. (2018), diabetic patients who seek health information and utilize it effectively have better blood glucose control, which reduces the risk of complications.

4.5.9 Research Question 9: What are the socio-economic determinants of health information-seeking behaviour of diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

Analysis from Table 4.15 revealed that educational status, wealth quintile, and geographical location could significantly influence the health information-seeking behaviour and utilisation of diabetic patients in tertiary healthcare facilities in North Central, Nigeria. The educational status could be because diabetic patients with lower educational attainment often have lower health literacy, which refers to the ability tounderstand and use health information effectively. This can hinder their ability to seek and comprehend diabetes-related health information. Also, individuals with lower educational levels may have limited skills and access to digital technologies, making it challenging to navigate online health resources or utilise digital health tools effectively. Moreover, less- educated individuals may have limited knowledge about available health information

sources, such as reputable websites, healthcare providers, or community resources, resulting in reduced information-seeking behaviour.

Table 4.15 also shows that wealth quintile is another socio-economic determinant of the health information-seeking behaviour of diabetic patients in tertiary healthcare facilities in North Central Nigeria, which may be because of the limited resources of diabetic patients. Individuals in lower wealth quintiles may face financial constraints, limiting their ability to access health information through paid subscriptions, books, or attending health-related events or workshops. They may also lack adequate health insurance coverage; treatment for diabetes mellitus is becoming expensive day by day; therefore, the lack of adequate health insurance coverage among lower-income individuals can lead to limited access to healthcare services and, consequently, restricted opportunities for seeking health information and guidance. Furthermore, diabetic patients' wealth quintile can also limittheir Internet access. Internet service providers such as MTN, GLO, Airtel, 9Mobile, Spectranet, and Starlink offer data subscriptions that are no longer friendly but on the high side, so diabetic patients with lower income may have limited access to the Internet or digital devices, reducing their opportunities for utilising online health information platforms.

The reason why geographical location was one of the socioeconomic determinants identified by diabetic patients studied was because most diabetic patients have to travel from far locations to access health facilities. Disparities in healthcare infrastructure, such as the availability of healthcare facilities, trained healthcare professionals, and health information centers, impact the accessibility of health information for diabetic patients.

Diabetic patients in rural or remote areas often face geographic barriers and limited transportation options.

The above findings, however, correlate with that of Eke *et al.* (2022) in a cross-sectional study of the disparity and factors associated with internet health information seeking among adults living with diabetes mellitus, who discovered that age, education, and household income were found to be significant factors influencing internet health information seeking among adults diagnosed with diabetes. Jamal *et al.* (2015) also agreed that geographical location was one of the socio-economic determinants of health information-seeking behaviour when the co-authors revealed in the study of the association of online health information–seeking behaviour and self-care activities among type 2 diabetic patients in Saudi Arabia that the availability and accessibility of medical offices, and the nature of patient-doctor communication, impact information seeking behaviour.

Similarly, Zare-Farashbandi *et al.* (2017) examined the effect of the patient-physician relationship on the health information-seeking behaviour of diabetic patients and observed that patients' socioeconomic status, educational level, and distance from diagnosis correspond to the types of information sought and applied in diabetes self-care efforts. These factors are important in shaping patients' self-care approach and their health behaviour changes.

4.5.10 Research Question 10: What challenges are faced by diabetic patients in using health information in tertiary healthcare facilities in North Central, Nigeria?

Findings from this research question revealed that the challenges encountered by diabetic patients studied in their health information seeking and utilisation were: the high cost of

data subscription, data smog (information overload), lack of adequate diabetic programs on radio and television stations, lack of adequate hard copy materials, and lack of understanding information due to scientific and medical terms used, please see Table 4.16. The high cost of data subscriptions could be connected to the inflation rate. Because we live in an increasingly digital world, access to the Internet is essential for seeking health information. However, the high cost of data subscriptions can limit individuals' ability to access relevant resources. Data subscription rates have increased exponentially; therefore, affordability concerns may prevent the diabetic patients studied from regularly utilizing the Internet to seek information on self-management, treatment options, and lifestylemodifications.

Again, the digital age has also posed another challenge of data smog (information overload). The proliferation of health information online can lead to information overload, known as data smog. With countless websites, blogs, and social media platforms, individuals seeking diabetes-related information may struggle to navigate through the vast amount of available information content. The abundance of conflicting or unreliable information can also be overwhelming, leading to confusion, frustration, and a lack of clarity on which sources to trust. Data smog can hinder effective health information seekingand utilisation for diabetes management.

The study also revealed that the lack of adequate diabetic programs on radio and television stations was another challenge encountered by the person with diabetes studied. Because while the Internet is a primary source of health information, traditional media platforms such as radio and television remain important for reaching diverse populations. However, the lack of adequate diabetic programs on these platforms limits access to relevant

information. Publicly available health programs, talk shows, or educational segments specifically addressing diabetes management are scarce, impeding individuals' ability to access credible information through widely accessible channels. The research also gathered that diabetic programmes are majorly aired during world diabetic day, which is inadequate to provide the needed health information for managing the disease.

Most respondents complained about inadequate hard copy materials ($\bar{X}$= 2.70, StD=0.20), please see Table 4.16. While digital platforms have gained prominence, some individuals prefer or rely on printed materials for health information. However, the availability of hard-copy materials tailored to diabetes management is insufficient. Limited access to printed resources such as brochures, pamphlets, or booklets can hinder information-seeking behaviour for individuals who do not have digital literacy or prefer tangible resources. This challenge could also be due to lacking bibliotherapy services in the studied tertiary healthcare facilities.

Table 4.16 also revealed that lack of understanding information due to scientific andmedical terms was a challenge encountered by the diabetic patients studied. This could be because most diabetic patients do not have medical backgrounds. Therefore, diabetes-related health information often employs scientific and medical terminology that was difficult for them to understand. Complex terminology and jargon could create barriers to effective health information seeking and utilisation. Individuals may struggle to comprehend the meaning and implications of medical terms, making it challenging to applythe information to their daily self-management routines.

The above findings is in tandem with that of Iorver (2020) identified some of the challenges affecting the utilisation of health information resource by patients with diabetes in Benue State as: Lack of health information resources (=3.24, SD = 0.87); Difficulties in understanding the available health information resources (=3.05, SD = 0.98); Lack of applicability of health information resources (=3.22, SD = 0.86); Distance to health information sources (=3.24, SD = 0.93); Absence of diabetes data (=3.60, SD = 0.89); Absence of diabetes information network (=3.23, SD = 0.98); Ineffective communication strategies (=3.39, SD = 0.98); Poor health information literacy (=3.11, SD = 0.98); Lack of awareness of the existence of health information resources (=3.64, SD = 0.93); Poor Internet connectivity (=3.20, SD = 0.96); Absence of radio/television programmes on diabetes in local languages (=3.36, SD = 0.98); Absence of medical and public libraries(=3.54, SD =0.79); Slow adoption of Information Technology (=3.52, SD = 0.87); Lack of computer operation skills (=3.04, SD = 0.88) and Inaccessibility of health information resources (=3.11, SD = 0.63).

The current study contradicts that of Kalantzi *et al.* (2015), who carried out a cross- sectional study on the information-seeking behaviour of patients with diabetes mellitus in an outpatient clinic of a university-affiliated hospital in Athens, Greece. Kalantzi *et al*. (2015), while investigating the obstacles to information seeking, observed that the participants reported that important obstacles to information seeking were “lack of time” (33.5% of participants) and “cost” (31.5%), especially in younger patients <40 years old (78.3% and 65.2%, respectively), and those with higher education level and lower duration of the disease. Moreover, younger patients with Type 1 DM and those with higher education and higher income indicated that a large volume of unorganized information was

a significant barrier to obtaining useful information. Patients residing in rural areas indicated more frequently that lack of competent infrastructures (78.4%) and lack of health care providers (81.1%) were obstacles to information, indicating a deficiency in structures and staff to sufficiently cover the information needs of diabetic patients in these areas.

The current findings of the study revealed that lack of understanding information due to scientific and medical terms used was one of the problems encountered by diabetic patients aligns with the findings of Kostagiolas *et al.* (2021), who carried out a cross-sectional survey interconnecting health information seeking behaviour with clinical data of type 2 diabetes mellitus patients, revealed that the obstacles encountered during information seeking include the complicated nature of health information, which involves scientific terms as well as psychological issues. Similarly, Soroya *et al.* (2020), who researched understanding the information behaviour of diabetic patients: a case of the diabetic institutePakistan, revealed that inadequate access to health-related information is a significantbarrier faced by diabetic patients in Pakistan. Petersen et al. (2019) also investigated the challenges of adopting information communication technology for diabetes self-management in South Africa. They found that poor health literacy, limited access to resources, lack of knowledge about ICT devices, and low socio-economic status weremajor hindrances to adopting ICT for diabetes self-management.

4.5.11 Hypothesis 1: There is no significant influence of health information-seeking behaviour on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

Hypothesis 1 revealed that health information-seeking behaviour has a significant effect on the management of diabetes; please see Tables 4.17 and 4.18. This finding could beattributed to health information-seeking behaviour leading to increased knowledge and understanding. Seeking health information allows diabetic patients to learn and understand their condition. It gives them insights into the causes, symptoms, and complications of diabetes mellitus. Patients can make informed decisions about their lifestyle, treatment options, and self-management strategies by understanding the disease. Again, health information-seeking behaviour helps diabetic patients become aware of various treatment options. It enables individuals to explore and understand different approaches such as medication, insulin therapy, dietary changes, exercise, and complementary therapies. Seeking health information supports diabetic patients in adopting self-management practices and making necessary behavioural changes. Patients can develop and implement effective self-care routines by learning about healthy eating, portion control, carbohydrate counting, physical activity, stress management, and medication adherence. Also, health information-seeking behaviour improves treatment adherence among diabetic patients. Individuals can better understand the importance of following prescribed regimens byseeking information about their medications, including dosage, timing, and potential side effects.

Furthermore, seeking health information enables diabetic patients to stay updated on the latest research, advancements, and treatment options in diabetes management. This

knowledge empowers individuals to have informed discussions with healthcare providers and make decisions based on the most up-to-date evidence. Access to new research also helps patients understand emerging therapies, technologies, and strategies that can enhance their diabetes management.

The findings in hypothesis one resonate with that of Jamal *et al.* (2015), who revealed that health information-seeking behaviour significantly impacts diabetes mellitus; the findings further established that diabetes self-management was crucial in diabetes control. However, in the study, little was known about patient preferences for sources of health information. Patients can obtain information through various media sources, which may be passively obtained through active information-seeking behaviour. Also, the study of Jalilian *et al.* (2020) on the health care-seeking behaviours in type 2 diabetic patients in east Azerbaijan unraveled that online health-related information-seeking behaviour among adult type 2 diabetic patients positively impacts their self-care activities. This current study also corroborates with that of Wahyuni *et al.* (2017) in the study of the effect of diabetes self-management education on knowledge on the control of blood sugar on diabetes mellitus revealed that patients education was critical to the management of diabetes mellitus, as it can help change behaviour, increase knowledge, skills, attitudes and self-management skills among patients. Similarly, Clara *et al.* (2021), who investigated self-efficacy as a predictor of self-management behaviour practice among people with type 2 diabetes mellitus gathered that self-efficacy has also been identified as a significant predictor of self- management behaviour practice in diabetic patients. Accordingly, Kim *et al.* (2019) in the study of patients' experiences of diabetes self-management education according to health-

literacy levels, provided evidence of the significance of health information-seeking behaviour in managing diabetes mellitus.

4.5.12 Hypothesis 2: There is no significant influence of health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in NorthCentral, Nigeria

The regression analysis from hypothesis 2 revealed that health information utilisation has a significant effect on the management of diabetes mellitus (Table 4.19 and 4.20). This implies that proper health information utilisation will help manage diabetes mellitus. This could also be because health information empowers diabetic patients to take an active role in their care. By accessing and utilizing reliable information, diabetic patients can learn about the condition, understand treatment options, and learn self-management strategies. Also, utilising health information enhances treatment adherence among diabetic patients. Understanding the importance of medication regimens, dietary guidelines, exercise routines, and regular monitoring empowers individuals to adhere to recommended treatment plans. By following these guidelines, patients can better control their bloodglucose levels, reduce the risk of complications, and improve their overall health outcomes.

Similarly, diabetes management often requires lifestyle modifications, such as adopting a healthy diet, engaging in regular physical activity, managing stress, and quitting smoking. Health information utilisation provides diabetic patients with evidence-based guidelines and practical tips for implementing these lifestyle changes. By integrating these recommendations into their daily lives, individuals can effectively manage their diabetes and improve their quality of life. Health information utilisation equips diabetic patients

with knowledge about the potential complications of diabetes and the preventive measures to reduce the risk. By understanding the importance of routine check-ups, eye examinations, foot care, and other preventive strategies, individuals can take proactivesteps to minimize the impact of complications and maintain optimal health. Finally, when diabetic patients utilize health information effectively, they become empowered advocates for their health. They can actively participate in discussions with healthcare providers, ask relevant questions, seek clarification, and voice their concerns.

The study resonances with that of Olesen *et al.* 2017 who conducted a study in Denmark on higher health literacy associated with better glycemic control in adults with type 1 diabetes. High literacy is a positive indicator of health information utilisation. The study concluded that health information utilisation significantly impacted glycemic control, particularly in actively managing one's health. Similarly, another study conducted in the United States found that access to information through the Internet can empower individuals with diabetes to actively manage their condition (Shaw and Johnson, 2011). The study highlighted the increasing ubiquity of the internet and the availability of health information,which allows patients to seek, find, and use information about their health. This is particularly important for individuals with diabetes mellitus, as intensive self-management is critical for disease control. Furthermore, Uly *et al.* (2022) who explored the relationship between self-care behaviour and diabetes self-management education (DSME) in patients with type 2 diabetes mellitus (DMT2). The research conducted by Uly *et al.* (2022) highlighted the importance of health information utilisation, knowledge, and self-care behaviour in effectively managing type 2 diabetes mellitus.

4.5.13 Hypothesis 3: There is no significant influence of health information-seeking behaviour and health information utilisation on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

The findings from hypothesis 3 in Tables 4.21 and 4.22 imply that health information seeking behaviour and health information utilisation play a significant role in managing diabetes mellitus. The composite effect of these two variables on managing diabetes is enormous. This situation is so because of the various advantages that health information- seeking behaviour and health information utilisation of the diabetic patients in the studied institution poses, which are namely; empowerment and self-management, improved diseaseunderstanding, treatment adherence, shared decision making, prevention, and early intervention, continuous learning and empowerment. Health information-seeking behaviourand utilisation foster a culture of continuous learning and empowerment, enabling diabetic patients to adapt and incorporate new information into their diabetes management strategies. This ongoing engagement with health information supports individuals in staying abreast of advancements in diabetes care and management.

The result in hypothesis 3 is in tandem with that of Jamal *et al.* (2015), who explored the association between online health information-seeking behaviour and self-care activities among type 2 diabetic patients in Saudi Arabia. The study found that despite potential risks associated with online health information, many individuals with diabetes use the Internet to search for diabetes-related health information. The study highlighted the various behaviours exhibited by users in online diabetes communities, including peer support, advocacy, self-expression, humour, sharing, and seeking diabetes information, and have positively affected their management of diabetes mellitus.

The current study also concurred with the findings of Novianto *et al.* (2021) in investigating the effectiveness of health management-assisted technology in improving glycated hemoglobin levels in patients with type 2 diabetes mellitus. The study emphasized the role of information technology and telecommunications, such as the use of cell phones, in facilitating communication and providing important information related to the care and treatment of diabetes. The study concluded that health management assistive technology can be used as a medium for interventions that promote healthy lifestyles and improve diabetes management.

Similarly, the current study aligns with that of Eke *et al.* (2022), who examined the factors influencing internet health information seeking among adults living with diabetes mellitus in the United States. The study identified age, education, and household income as significant factors influencing internet health information seeking. The study also highlighted the importance of trust in the source of information and the connection betweenage and internet health information seeking. Also, Ghweeba *et al*. (2021), who examined how Egyptian Internet users received diabetes mellitus-related health information, found that the Internet has become a fundamental source of health-related information for managing diabetes.

The current study also corroborates that of Bosch-Frigola et al. (2022), who evaluated the impact of online health information-seeking behaviour during World Diabetes Mellitus Day in European countries. The study analysed changes in search trends and grouped countries based on factors such as diabetes mellitus prevalence, the existence of National Health Plans, and healthcare systems. The study revealed that health information seeking and

utilisation are crucial in managing diabetes mellitus (DM). The research revealed that analysing user activity collected through platforms like Google and Google Trends (GT) could provide valuable insights into health information-seeking behaviour (OHISB). These platforms have been used to evaluate the impact of the management of DM in various European countries positively.

4.5.14 Hypothesis 4: There is no significant influence of frequency of use, health information literacy, and socioeconomic determinants on the management of diabetes mellitus in tertiary healthcare facilities in North Central, Nigeria

The Regression analysis in hypothesis 4 revealed that frequency of use, health information literacy, and socioeconomic determinants significantly influence the management of diabetes mellitus. This implies that an increase in these variables will lead to better management of diabetes mellitus. The frequency with which individuals access health information related to diabetes affects their ability to manage the condition effectively. Regular access to reliable and up-to-date information allows individuals to stay informed about new treatment options, self-care practices, and advancements in diabetes management. By frequently using health information resources, individuals can make timely adjustments to their treatment plans, monitor their blood glucose levels, and adopt healthy lifestyle behaviours. Health information literacy allows an individual to understand and utilize health information effectively. For individuals managing diabetes, having a highlevel of health information literacy is crucial. It enables them to comprehend complex medical terminology, interpret test results, and understand treatment guidelines. Health information literacy empowers individuals to navigate various information sources, evaluate the credibility of information, and make informed decisions about their diabetes

management. Socio-economic determinants, such as income, education level, employment status, and access to healthcare resources, significantly influence the management of diabetes mellitus. These determinants can impact an individual's ability to access and utilizehealth information effectively.

The current findings in hypothesis 4 agreed with the findings of Rizqillah *et al.,* (2020) in Indonesia, where the co-authors investigated the factors influencing health-seeking behaviour among type 2 diabetes mellitus patients. The study reported that socio-demographic factors such as educational status, geographical location, and monthly income positively influence diabetic patients in managing diabetes mellitus. The findings also correlate with that of Eke *et al.* (2022) in a cross-sectional study of the disparity and factors associated with internet health information seeking among adults living with diabetes mellitus, who revealed that socio-economic factors such as age, education, and household income were found to be significant factors influencing diabetic patients in the management of diabetes mellitus.

Similarly, Lee *et al.* (2018) used a structural equation model linking health literacy to self-efficacy, self-care activities, and health-related quality of life in patients with type 2 diabetes. The study revealed a direct relationship between health literacy and self-efficacy with type 2 diabetes. Self-efficacy has also been empirically reported as a strong predictor of diabetes self-care activities. Kim *et al.* (2020), in investigating the health literacy and outcomes of a community-based self-help intervention: a case of Korean Americans with type 2 diabetes, revealed that self-efficacy and self-care skills significantly mediate between health literacy and glucose control and quality of life.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study's findings shed light on various aspects of health information-seeking behaviour, health information utilisation, and its impact on diabetes management. The study found that diabetic patients in these healthcare facilities use a variety of sources for health information, including the Internet, Facebook, health professionals, and family and friends. This indicates that patients seek information from multiple channels to manage their condition. Additionally, the study revealed that health information-seeking behaviour and utilisation have a significant influence on the management of diabetes mellitus. This suggests that accessing and utilising health information positively affects the management of the disease.

Furthermore, the study identified several benefits of health information-seeking behaviour and utilisation for diabetic patients. These benefits include reducing the cost of medication, knowing the right exercise and diet, maintaining blood glucose levels, quitting unhealthy habits, and providing first aid in a crisis. These findings highlight the practical impact of health information on the daily lives of diabetic patients.

However, the study also uncovered challenges diabetic patients face in their health information-seeking behaviour and utilisation. These challenges include the high cost of data subscription, information overload, lack of adequate diabetic programs on mediaplatforms, and difficulty understanding scientific and medical terms. Addressing thesechallenges is crucial to ensure that patients can access and understand the health

information they need and enhance the overall management and outcomes of diabetes mellitus in Nigeria and beyond.

5.2 Recommendations

Based on the findings that emanated from the study, the following recommendations are made:

1. The tertiary healthcare facilities' management should make their library services available to diabetic patients, not just medical professionals alone.

2. The management of the tertiary healthcare facilities as well as the library management studied, should provide information materials that will help people to know when to seek medical help if they experience diabetic symptoms, develop comprehensive guides on the proper diet for people with diabetes, including meal plans, food choices, tips for managing blood sugar level, designed exercise programmes tailored specifically for diabetes patients and benefits of regular exercise.

3. The management of the tertiary healthcare facility and the institution's library should continue to provide informative booklets and brochures in the facilities, and libraries should develop a user-friendly website or portal dedicated to diabetesinformation. Develop a dedicated mobile app that consolidates diabetes information and provides tracking tools for symptoms and blood sugar levels. The library management in the tertiary healthcare facilities studied should provide bibliotherapyservices for diabetic patients attending the healthcare facilities studied.

4. The management in the tertiary healthcare facilities studied should continue to provide high-quality booklets, brochures, and leaflets that contain the latest information on diabetes management to be distributed during Mopd. They should also provide free Wi-Fi in the waiting area to facilitate information sharing and using Facebook and WhatsApp.

5. The management of the tertiary health care facilities studied should have a diabetic education unit. This unit should provide diabetic patients with digital literacy training, organise health information sharing workshops, source identification education, and information application so that diabetic patients can manage the disease as this will help in sustaining the health literacy skills of diabetic patients and also train those who have little or no skills.

6. The World Health Organisation and International Diabetic Federation should sponsor the publishing of diabetic information on booklets, brochures, leaflets,magazines, newspapers, WhatsApp groups, Instagram, blogs, Twitter, and broadcastmedia. And also work with platform providers to implement features that promote accurate health information and prevent the spread of misinformation, contributing to a healthier online information ecosystem.

7. The health care professionals attending to the diabetic patients in the tertiary health care facilities studied should provide psychological support for diabetic patients who engage in health information seeking and utilisation. Also, health information providers should tailor health information in paper and digital formats to minimize negative psychological impacts.

8. Health information providers should incentivise the active use of health information by diabetic patients. This initiative will encourage the use of health information, which will positively impact the management of their health.

9. Health information providers should design health information so that it is suitable for individuals from varying educational backgrounds. These programs should use plain language and visual aids to ensure that even those with lower educational attainment can access and understand health information. Subsidy for individuals from lower wealth quintiles to access essential health information resources. This could include covering the cost of educational materials or Internet access. Finally, healthcare facilities studies should establish telehealth services to meet the needs of those in disadvantaged geographical locations.

10. The management of the facilitates and other stakeholders should lessen the financial burden on diabetic patients by exploring partnerships with telecommunication companies or government initiatives to subsidize or provide affordable data plans, mitigate information overload, expand diabetic programs in media, enhance the availability of hard copy materials, simplify medical terminology and adoption of digital inclusion initiatives that go beyond data affordability, including programs that provide smartphones or digital devices to individuals with limited access.

11. The stakeholders in the fight against diabetes mellitus should develop patient empowerment schemes to improve diabetic patients' information-seeking behaviour.

12. The management of the tertiary healthcare facilities studied should consider making policy recommendations to improve and support health information utilisation for the management of diabetes mellitus. Tertiary healthcare institutions should collaborate with healthcare professionals, patient advocacy groups, andorganisations working on diabetes management to ensure that diabetic patients sustain the usage of health information.

13. Diabetic patients studied should continue to be proactive in their health information seeking, engage in continuous learning by attending workshops, webinars, or support group meetings to enhance their knowledge and skills and explore and utilize a variety of information sources, including online platforms, printed materials, and direct communication with healthcare professionals as combining insights from different sources can provide a holistic understanding of diabetes management strategies.

14. Diabetic patients in the studied tertiary institutions should continue to use health information and keep updating their information literacy skills to manage diabetes mellitus properly.

5.3 Contribution to Knowledge

1. The research findings contribute to understanding the diverse sources from which diabetic patients seek health information. These include traditional sources like booklets, brochures, and leaflets from clinics and modern digital platforms like the Internet, WhatsApp, and Facebook groups. Recognizing this variety underscores the

need for healthcare providers to ensure information accessibility across different channels to cater to diverse patient preferences and needs.

2. The study sheds light on the health information literacy skills of diabetic patients, highlighting areas where they may require support or education. Skills such as computer and Internet navigation, sharing health information across platforms, identifying credible sources, recognizing information needs, and utilizing information for decision-making are crucial for effective self-management of diabetes mellitus. Addressing deficiencies in these skills can empower patients to better engage with health information and make informed decisions about their care.
3. The study demonstrates the significant influence of health information-seeking behavior and utilisation on managing diabetes mellitus; the research underscores the pivotal role of patient empowerment through information access and utilisation in improving health outcomes. This insight emphasises the importance of integrating patient education and empowerment strategies into diabetes care protocols within tertiary healthcare facilities in North-central Nigeria and potentially beyond.
4. The study contributes methodologically by employing statistical analyses to quantify the influence of health information-seeking behavior and utilisation on diabetes management. This approach provides empirical evidence supporting the relationship between these variables, enhancing our understanding of the mechanisms underlying effective patient engagement with health information. Such methodological rigor strengthens the validity and generalizability of the findings, providing a basis for future research and interventions in similar contexts.

5.4 Implications of the Study

This study has significant implications for healthcare providers, policymakers, and diabetic patients in Nigeria.

Firstly, healthcare providers can use this study's findings to understand better the health information-seeking behavior and utilisation patterns of diabetic patients. By recognising the various health information sources patients use, such as the internet, social media, and healthcare professionals, providers can tailor their communication strategies to effectively reach and engage with patients. This can lead to improved patient education, adherence to treatment plans, and overall diabetes management.

Secondly, policymakers can utilise the findings of this study to develop targeted interventions and policies that address the challenges faced by diabetic patients in accessing and utilizing health information. For example, addressing the high cost of data subscription and improving the availability of diabetic programmes on media platforms can enhance the accessibility of health information for patients. Policymakers can also focus on improving health information literacy among diabetic patients, particularly in understanding scientific and medical terms. By addressing these challenges, policymakers can empower patients to make informed decisions about their healthand improve their diabetes management outcomes.

Lastly, diabetic patients themselves can benefit from the implications of this study. By understanding the benefits of health information-seeking behaviour and utilisation, patients can actively seek and utilize health information to manage their condition better. This includes knowing the right exercise and diet, maintaining blood glucose levels, and quitting unhealthy habits. Additionally, patients can be aware of the challenges they may face in accessing and understanding health information and seek support from healthcare providers and policymakers to overcome these challenges.

5.5 Suggestions for Further Studies

1. This study focused on diabetic patients at North-central. Therefore, conducting the study in South-west and South-south of Nigeria would be good. This will enable the research to understand the information-seeking behaviour of diabetic patients in various geo-political zones in Nigeria.

2. The current study considered only two variables among various factors that can predict the management of diabetes mellitus. Further studies should consider other factors, such as reading culture and reading time among others, in managing diabetes mellitus in healthcare facilities.

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APPENDIX A

QUESTIONNAIRE ON HEALTH INFORMATION SEEKING BEHAVIOUR AND UTILISATION FOR THE MANAGEMENT OF DIABETES MELLITUS AMONG PATIENTS TERTIARY healthcare FACILITIES IN NORTH CENTRAL(HISBUMDM)

Section A: Demographic Data

1. Name of Facility:
   ……..…
   ……...
2. Gender: Male [ ] Female [ ]
3. Age: (a)5- 15 [ ] (b) 16-25 [ ] (c) 26 -35 (d) 36 -45 (e) 46 – 55 (f) 56 above
4. Occupation: (a) Student [ ] (b) Business [ ] (c) Artisan [ ] (d) Civil Servant [ ] (e) Applicant [ ] (f) Health Professional
   Others: ……
5. What is the highest level of education you attained: (a) No formal education [ ] (b) Primary school [ ] (c) Secondary school [ ](c)Tertiary education [ ]
   Others specify:
   ……
6. Years of illness: Below 5yrs [ ] 6-15yrs [ ] 16-25yrs [ ] above 25 yrs. [ ]

Section B: Sources of Health Information Used by Diabetics Patients

Please indicate the sources of health information you used by ticking (√)

S/NO	Sources of Health Information	Yes	No
1.	Books		
2.	Journal articles		
3.	Booklets, brochures, leaflets etc., from clinic or health professionals		
4.	Magazines/newspaper/news magazine		
5.	Internet		
6.	WhatsApp groups		
7.	Facebook pages/Facebook groups		
8.	Blogs		
9.	Twitter		
10.	Instagram		
11.	Health professionals		
12.	Broadcast media (television, radio)		
13.	Diabetic Patients' Associations		

14.	Family and friends		
15.	Seminars for diabetics		
16.	Other patients with diabetes		

Others please specify: ……..

Section C: The Health Information Needs of Diabetic Patients

Please indicate your opinion on your health information need by ticking (√) the right option

S/NO	**STATEMENTS**	**SA 4**	**A 3**	**D 2**	**SD 1**
1.	I need information on what diabetes means				
2.	I need information on the symptoms of diabetes				
3.	I need information on the causes of diabetes				
4.	I need information on the complications of diabetes				
5.	I need information on the proper diet for people with diabetes				
6.	I need information on the right exercise for diabetic patients				
7.	I need information on the new medications for diabetes				
8.	I need information on when I should start taking insulin and how I should use insulin				
9.	I need information on the measures taken to avoid foot complications of DM				
10.	I need information on the symptoms of hypoglycemia				
11.	I need information on the sexual problems due to diabetes				
12.	I need information on what to do in case of another illness (such as infection)				

Others please specify: ……..……

Section D: Health Information Seeking Behaviours of Diabetic Patients

Please indicate your opinion on your health information seeking behaviour by ticking (√) the right option

S/N	STATEMENTS	SA 4	A 3	D 2	SD 1
1.	I seek health information from books for the management of diabetes				
2.	I seek health information from journal articles for the management of diabetes				
3.	I seek health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the management of diabetes				
4.	I seek health information from magazines/newspaper/news magazines for the management of diabetes				
5.	I seek health information from the Internet for the management of diabetes				
6.	I seek health information from WhatsApp groups for the management of diabetes				
7.	I seek health information from Facebook pages/Facebook groups for the management of diabetes				
8.	I seek health information from Blogs for the management of diabetes				
9.	I seek health information from Twitter for the management of diabetes				
10.	I seek health information from Instagram for the management of diabetes				
11.	I seek information from health professionals for the management of diabetes				
12.	I seek health information from broadcast media (television, radio) for the management of diabetes				
13.	I seek information from Diabetic Patients' Associations for the management of diabetes				
14.	I seek information from family and friends for the management of diabetes				
15.	I seek information seminars for diabetics for the management of diabetes				
16.	I seek information from other patients with diabetes for the management of diabetes				

Section E: The frequency of usage of health information for the management of diabetes by diabetic patients in tertiary healthcare facilities in North Central Nigeria

Please indicate your opinion on the frequency of health information by ticking (√) the right option

S/NO	ITEMS	Multiple Times a Day 5	Daily 4	Weekly 3	Monthly 2	Quarterly 1
1.	Books					
2.	Journal articles					
3.	Booklets, brochures, leaflets, etc., from clinic or health professionals					
4.	Magazines/newspaper/news magazines					
5.	Internet					
6.	WhatsApp groups					
7.	Facebook pages/Facebook groups					
8.	Blogs					
9	Twitter					
10	Instagram					
11	Health professionals					
12	Broadcast media (television, radio)					
13	Diabetic Patients' Associations					
14	Family and friends					
15	Seminars for diabetics					
16	Other patients with diabetes					

Section F: The health information literacy skill of diabetic patients in tertiary health facilities in North Central Nigeria

S/NO	STATEMENTS	SA 4	A 3	D 2	SD 1
1.	I have computer and Internet navigation skills				
2.	I have the skills in sharing health information across various platforms				
3.	I have the skills to identify health information sources				
4.	I have the skills to recognize my health information needs				
5.	I have the skills to assess quality health information				
6.	I have the skills to retrieve health information resources				
7.	I have the skills on how to use health information to make a good decision				

Section G: The level of satisfaction in the use of diabetic mellitus related information in tertiary healthcare facilities in North Central Nigeria

S/NO	ITEMS	VS 4	S 3	D 2	VD 1
1.	How satisfied are you with the use of books?				
2.	How satisfied are you with the use of journal articles ?				
3.	How satisfied are you with the use of booklets, brochures, leaflets, etc., from clinic or health professionals?				
4.	How satisfied are you with the use of magazines/newspaper/news magazine?				
5.	How satisfied are you with the use of Internet?				
6.	How satisfied are you with the use of WhatsApp groups?				
7.	How satisfied are you with the use of Facebook pages/Facebook groups?				
8.	How satisfied are you with the use of blogs?				

9	How satisfied are you with the use of twitter?				
10	How satisfied are you with the use of Instagram?				
11	How satisfied are you with the use of Health professionals?				
12	How satisfied are you with the use of broadcast media (television, radio)?				
13	How satisfied are you with the use of Diabetic Patients'? Associations?				
14	How satisfied are you with the use of family and friends?				
15	How satisfied are you with the use of seminars for diabetics?				
16	How satisfied are you with the use of health information from other patients with diabetes?				

Key: VS: Very Satisfied, S: Satisfied, D: Dissatisfied, VD: Very Dissatisfied

Section H: Effect of health information seeking behaviour on emotional behaviour (Mental Health) of diabetic patients in tertiary healthcare facilities in North Central Nigeria

Please indicate the effect of health information seeking behaviour on your mental behaviour by ticking (√) the right option

S/NO	ITEMS	SA 4	A 3	D 2	SD 1
1.	Does your information-seeking behaviour make you anxious?				
2.	Does your information-seeking behaviour make you depressed?				
3.	Does your information-seeking behaviour affect your personality?				
4.	Does your information-seeking behaviour cause you delusion?				
5.	Does your information-seeking behaviour make you think negatively?				

6.	Does your information-seeking behaviour make you hallucinate?				
7.	Does your information-seeking behaviour give you mood swings?				
8.	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?				
9.	Does your information-seeking behaviour make you lose interest in activities?				

Section I: The impact of health information–seeking behaviour on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria

Please indicate your opinion on the impact of information seeking behaviour on the management of DM by ticking (√) the right option

S/NO	STATEMENTS	SA 4	A 3	D 2	SD 1
1.	My health information-seeking behaviour has reduced the money I spend on drugs				
2.	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in				
3.	My health information-seeking behaviour reduced my visit to the healthcare centre				
4.	My health information-seeking behaviour has helped me to know the proper diet to take				
5.	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus				
6.	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible				
7.	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)				
8.	My health information-seeking behaviour helps me to give first aid attention if there is a crisis				

Section J: The socio-economic determinants of health information seeking behaviour among patients in tertiary healthcare facilities in North Central Nigeria

Please indicate your opinion on the socio-economic determinants of health information seeking behaviour by ticking (√) the right option

S/NO	STATEMENTS	SA 4	A 3	D 2	SD 1
1.	My age affects my health information-seeking behaviour				
2.	My educational status affects my health information-seeking behaviour				
3.	My employment status affects my health information-seeking behaviour				
4.	My wealth quintile affects my health information-seeking behaviour				
5.	My marital status affects my health information-seeking behaviour				
6.	My geographical location affects my health information-seeking behaviour				
7.	My religion affects my health information-seeking behaviour				

Others please specify: ……

Section K: The challenges encountered in seeking health information of diabetic patients in tertiary healthcare facilities in North Central Nigeria

S/NO	STATEMENTS	SA 4	A 3	D 2	SD 1
1.	Lack of time				
2.	High cost of data subscription				
3	Poor Internet connectivity				
4.	Data smog (Information overload)				
5.	Lack of adequate diabetic programs on radio and television stations				
6.	Lack of adequate hard copy materials				
7.	Lack of computer literacy				
8.	Psychological issues				
9.	Lack of understanding information due to scientific and medical terms used				
10.	Problems in the doctor-patient relationship				

APPENDIX B

RELIABILITY DATA

SECTION B

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.873	.812	16

SECTION C

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.766	.725	12

SECTION D

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.897	.814	16

SECTION E

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.594	.481	16

SECTION F

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.826	.739	7

SECTION G

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.881	.845	16

SECTION H

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.762	.836	9

SECTION I

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.732	.676	8

SECTION J

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.914	.864	7

SECTION K

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.879	.814	10

The Average Cronbach's Alpha
= 0.873 + 0.766 + 0.897 + 0.594 + 0.862+0.881+0.762+0.732+0.914 +0.879 /10
= 7.298/10 =0.730
Cronbach's Alpha = 0.73 (shows the instrument is reliable)

APPENDIX C

Research Question 2: What is the information needs of diabetic patients in tertiary healthcare facilities in North Central Nigeria?

Federal Medical Centre Bida, Niger State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I need information on what diabetes means	16(42.1)	7(18.4)	9(23.7)	6(15.8	38	2.87	1.14
2	I need information on the symptoms of diabetes	15(39.5)	10(26.3)	6(15.8)	7(18.4)	38	2.87	1.14
3	I need information on the causes of diabetes	3(7.9)	5(13.2)	8(21.1)	22(57.9)	38	1.71	0.98
4	I need information on the complications of diabetes	5(13.2)	7(18.4)	6(15.8)	20(52.6)	38	1.92	1.12
5	I need information on the proper diet for people with diabetes	14(36.8)	7(18.4)	6(15.8)	11(28.9)	38	2.63	1.26
6	I need information on the right exercise for diabetic patients	9(23.7)	7(18.4)	3(7.9)	19(50.0)	38	2.16	1.29
7	I need information on the new medications for diabetes	7(18.4)	19(50.0)	4(10.5)	8(21.1)	38	2.66	1.02
8	I need information on when I should start taking insulin and how I should use insulin	8(21.1)	11(28.9)	13(34.2)	6(15.8)	38	2.55	1.00
9	I need information on the measures taken to avoid foot complications of DM	5(13.2)	5(13.2)	6(15.8)	22(57.9)	38	1.82	1.11
10	I need information on the symptoms of hypoglycemia	13(34.2)	7(18.4)	10(26.3)	8(21.1)	38	2.66	1.17
11	I need information on the sexual problems due to diabetes	4(10.5)	5(13.2)	8(21.1)	21(55.3)	38	1.79	1.04
12	I need information on what to do in case of another illness (such as infection)	3(7.9)	3(7.9)	15(39.5)	17(44.7)	38	1.79	0.91

Federal Medical Centre Makurdi, Benue State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I need information on what diabetes means	19(45.2)	6(14.3)	7(16.7)	10(23.8)	42	2.81	1.25
2	I need information on the symptoms of diabetes	15(35.7)	8(19.0)	9(21.4)	10(23.8)	42	2.67	1.20

3	I need information on the causes of diabetes	15(35.7)	5(11.9)	10(23.8)	12(28.6)	42	2.55	1.25
4	I need information on the complications of diabetes	19(45.2)	5(11.9)	6(14.3)	12(28.6)	42	2.74	1.31
5	I need information on the proper diet for people with diabetes	14(33.3)	8(19.0)	7(16.7)	13(31.0)	42	2.55	1.25
6	I need information on the right exercise for diabetic patients	20(47.6)	9(21.4)	3(7.1)	10(23.8)	42	2.93	1.24
7	I need information on the new medications for diabetes	5(11.9)	15(35.7)	3(7.1)	19(45.2)	42	2.14	1.14
8	I need information on when I should start taking insulin and how I should use insulin	3(7.1)	10(23.8)	12(28.6)	17(40.5)	42	1.98	0.98
9	I need information on the measures taken to avoid foot complications of DM	16(38.1)	5(11.9)	9(21.4)	12(28.6)	42	2.60	1.27
10	I need information on the symptoms of hypoglycemia	8(19.0)	6(14.3)	13(31.0)	15(35.7)	42	2.17	1.12
11	I need information on the sexual problems due to diabetes	18(42.9)	4(9.5)	8(19.0)	12(28.6)	42	2.67	1.30
12	I need information on what to do in case of another illness (such as infection)	7(16.7)	3(7.1)	13(31.0)	19(45.2)	42	1.95	1.10

Federal Medical Centre Lokoja, Kogi State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I need information on what diabetes means	9(20.0)	5(11.1)	9(20.0)	22(48.9)	45	2.02	1.20
2	I need information on the symptoms of diabetes	15(33.3)	10(22.2)	10(22.2)	10(22.2)	45	2.67	1.20
3	I need information on the causes of diabetes	14(31.1)	9(20.0)	9(20.0)	13(28.9)	45	2.53	1.22
4	I need information on the complications of diabetes	15(33.3)	10(22.2)	8(17.8)	12(26.7)	45	2.63	1.21
5	I need information on the proper diet for people with diabetes	11(24.4)	15(33.3)	12(26.7)	7(15.6)	45	2.67	1.02
6	I need information on the right exercise for diabetic patients	12(26.7)	10(22.2)	3(6.7)	20(44.4)	45	2.31	1.29
7	I need information on the new medications for diabetes	5(11.1)	15(33.3)	6(13.3)	19(42.2)	45	2.13	1.10
8	I need information on when I should start taking insulin and how I should use insulin	16(35.6)	5(11.1)	15(33.3)	9(20.0)	45	2.62	1.17
9	I need information on the measures taken to avoid foot complications of DM	15(33.3)	5(11.1)	13(28.9)	12(26.7)	45	2.51	1.22

10	I need information on the symptoms of hypoglycemia	8(17.8)	6(13.3)	14(31.1)	17(37.8)	45	2.11	1.11
11	I need information on the sexual problems due to diabetes	15(33.3)	5(11.1)	12(26.7)	13(28.9)	45	2.49	1.24
12	I need information on what to do in case of another illness (such as infection)	15(33.3)	8(17.8)	10(22.2)	12(26.7)	45	2.58	1.21

Federal Medical Centre Keffi, Nasarawa State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I need information on what diabetes means	18(51.4)	4(11.4)	9(25. 7)	4(11.4)	35	3.03	1.24
2	I need information on the symptoms of diabetes	12(34. 3)	9(25.7)	8(22.9)	6(17.1)	35	2.77	1.11
3	I need information on the causes of diabetes	12(34.3)	10(28.6)	8(22.9)	5(14.3)	35	2.83	1.07
4	I need information on the complications of diabetes	16(45.7)	2(5.7)	10(28.6)	7(20.0)	35	2.77	1.24
5	I need information on the proper diet for people with diabetes	18(51.4)	7(20.0)	7(20.0)	3(8.6)	35	3.14	1.03
6	I need information on the right exercise for diabetic patients	13(37.1)	11(31.4)	6(17.1)	5(14.3)	35	2.91	1.07
7	I need information on the new medications for diabetes	2(5.7)	12(34.3)	6(17.1)	15(42.9)	35	2.03	1.01
8	I need information on when I should start taking insulin and how I should use insulin	5(14.3)	4(11.4)	11(31.4)	15(42.9)	35	1.97	1.07
9	I need information on the measures taken to avoid foot complications of DM	7(20.0)	4(11.4)	8(22.9)	16(45.7)	35	2.06	1.19
10	I need information on the symptoms of hypoglycemia	7(20.0)	6(17.1)	14(40.0)	8(22.9)	35	2.34	1.06
11	I need information on the sexual problems due to diabetes	10(28.6)	5(14.3)	9(25.7)	11(31.4)	35	2.40	1.22
12	I need information on what to do in case of another illness (such as infection)	6(17.1)	4(11.4)	11(31.4)	14(40.0)	35	2.17	1. 09

Jos University Teaching Hospital, Plateau State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I need information on what diabetes means	16(26.2)	5(8.2)	17(27.9)	23(37.7	61	2.23	1.22
2	I need information on the symptoms of diabetes	11(18.0)	16(26.2)	5(8.2)	29(47.5)	61	2.15	1.21
3	I need information on the causes of diabetes	11(18.0)	16(26.2)	16(26.2)	18(29.5)	61	2.33	1.09
4	I need information on the complications of diabetes	30(49.2)	7(11.5)	7(11.5)	17(27.9)	61	2.82	1.31
5	I need information on the proper diet for people with diabetes	29(47.5)	9(14.8)	11(18.0)	12(19.7	61	2.90	1.21
6	I need information on the right exercise for diabetic patients	27(44.3)	14(23.0)	6(9.8)	14(23.0)	61	2.89	1.21
7	I need information on the new medications for diabetes	14(23.0)	30(49.2)	10(16.4)	7(11.5)	61	2.84	0.92
8	I need information on when I should start taking insulin and how I should use insulin	21(34.4)	14(23.0)	13(21.3)	13(21.3)	61	2.70	1.16
9	I need information on the measures taken to avoid foot complications of DM	23(37.7)	15(24.6)	12(19.7)	11(18.0)	61	2.82	1.33
10	I need information on the symptoms of hypoglycemia	12(19.7)	9(14.8)	20(32.8)	20(32.8)	61	2.21	1.11
11	I need information on the sexual problems due to diabetes	10(16.4)	8(13.1)	10(16.4)	33(54.1)	61	1.92	1.16
12	I need information on what to do in case of another illness (such as infection)	11(18.0)	3(4.9)	30(49.2)	17(27.9)	61	2.13	1.02

University of Abuja Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	I need information on what diabetes means	20(37.0)	7(13.0)	15(27.8)	12(22.8)	54	2.65	1.20
2	I need information on the symptoms of diabetes	20(37.0)	16(29.6)	8(14.8)	10(18.5)	54	2.85	1.12
3	I need information on the causes of diabetes	11(20.4)	16(29.6)	17(31.5)	10(18.5)	54	2.52	1.02
4	I need information on the complications of diabetes	21(38.9)	10(18.5)	4(7.4)	19(35.2)	54	2.61	1.32

5	I need information on the proper diet for people with diabetes	23(42.6)	9(16.7)	11(20.4)	11(20.4)	54	2.81	1.19
6	I need information on the right exercise for diabetic patients	21(38.9)	13(24.1)	6(11.1)	14(25.9)	54	2.76	1.22
7	I need information on the new medications for diabetes	7(13.0)	27(50.0)	10(18.5)	10(18.5)	54	2.57	0.94
8	I need information on when I should start taking insulin and how I should use insulin	17(31.5)	13(24.1)	12(22.8)	12(22.8)	54	2.65	1.15
9	I need information on the measures taken to avoid foot complications of DM	10(18.5)	9(16.7)	11(20.4)	24(44.4)	54	2.09	1.17
10	I need information on the symptoms of hypoglycemia	12(22.2)	8(14.8)	18(33.3)	16(29.6)	54	2.30	1.27
11	I need information on the sexual problems due to diabetes	10(18.5)	7(13.0)	9(16.7)	28(51.9)	54	1.98	1.18
12	I need information on what to do in case of another illness (such as infection)	3(5.6)	5(9.3)	23(42.6)	23(42.6)	54	1.78	0.84

University of Abuja Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I need information on what diabetes means	14(24.1)	7(12.1)	14(24.1)	23(39.7)	58	2.21	1.21
2	I need information on the symptoms of diabetes	9(15.5)	13(22.4)	11(19.0)	25(43.1)	58	2.10	1.14
3	I need information on the causes of diabetes	8(13.8)	10(17.2)	16(27.6)	24(41.4)	58	2.03	1.08
4	I need information on the complications of diabetes	13(22.4)	4(6.9)	20(34.5)	21(36.2)	58	2.16	1.15
5	I need information on the proper diet for people with diabetes	28(48.3)	12(20.7)	7(12.1)	11(19.0)	58	2.98	1.18
6	I need information on the right exercise for diabetic patients	23(39.7)	13(22.4)	5(8.6)	17(29.3)	58	2.72	1.27
7	I need information on the new medications for diabetes	9(15.5)	21(36.2)	7(12.1)	21(36.)	58	2.31	1.13
8	I need information on when I should start taking insulin and how I should use insulin	21(36.2)	12(20.7)	11(19.0)	14(24.1)	58	2.69	1.20
9	I need information on the measures taken to avoid foot complications of DM	24(41.4)	15(25.9)	10(17.2)	9(15.5)	58	2.93	1.11
10	I need information on the symptoms of hypoglycemia	11(19.0)	7(12.1)	17(29.3)	23(39.7)	58	2.10	1.14
11	I need information on the sexual problems due to diabetes	11(19.0)	7(12.1)	10(17.2)	30(51.7)	58	1.98	1.19
12	I need information on what to do in case of another illness (such as infection)	12(20.7)	6(10.3)	16(27.6)	24(41.4)	58	2.10	1.17

Research Question 3: What is the health information seeking behaviour of diabetic patients in tertiary healthcare facilities in North Central Nigeria?

Federal Medical Centre Bida, Niger State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I use health information from books for the management of diabetes	6(15.8)	8(21.1)	7(18.4)	17(44.7)	38	2.08	1.14
2	I use health information from journal articles for the management of diabetes	5(13.2)	8(21.1)	8(21.1)	17(44.7)	38	2.03	1.10
3	I use health information from booklets, brochures, leaflets, etc., from clinics or	11(28.9)	10(26.3)	5(13.2)	12(31.6)	38	2.53	1.22

	health professionals for the management of diabetes							
4	I use health information from magazines/newspaper/news magazines for the management of diabetes	13(34.2)	4(10.5)	5(13.2)	16(42.1)	38	2.37	1.34
5	I use health information from the Internet for the management of diabetes	19(50.0)	4(10.5)	6(15.8)	19(23.7)	38	2.87	1.27
6	I use health information from WhatsApp groups for the management of diabetes	19(50.0)	11(28.9)	6(15.8)	2(5.3)	38	3.24	9.13
7	I use health information from Facebook pages/Facebook groups for the management of diabetes	17(44.7)	3(7.9)	12(31.6)	6(15.8)	38	2.82	1.18
8	I use health information from Blogs for the management of diabetes	4(10.5)	4(10.5)	8(21.1)	22(57.9)	38	1.74	1.03
9	I use health information from Twitter for the management of diabetes	4(10.5)	6(15.8)	11(28.9)	17(44.7)	38	1.92	1.02
10	I use health information from Instagram for the management of diabetes	5(13.2)	11(28.9)	7(18.4)	15(39.5)	38	2.16	1.10
11	I use information from health professionals for the management of diabetes	8(21.1)	19(50.0)	6(15.8)	5(13.2)	38	2.79	0.93
12	I use health information from broadcast media (television, radio) for the management of diabetes	5(13.2)	16(42.1)	5(13.2)	12(31.6)	38	2.37	1.08
13	I use information from Diabetic Patients' Associations for the management of diabetes	6(15.8)	5(13.2)	7(18.4)	20(52.6)	38	1.92	1.15
14	I use information from family and friends for the management of diabetes	17(44.7)	11(28.9)	6(15.8)	4(10.5)	38	3.08	1.02
15	I use information seminars for diabetics for the management of diabetes	5(13.2)	5(13.2)	7(18.4)	21(55.3)	38	1.84	1.10
16	I use information from other patients with diabetes for the management of diabetes	3(7.9)	6(15.8)	8(21.1)	21(55.3)	38	1.76	0.99

Federal Medical Centre Makurdi, Benue State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I use health information from books for the management of diabetes	5(11.9)	7(16.7)	13(31.0)	17(40.5)	42	2.00	1.04
2	I use health information from journal articles for the management of diabetes	2(4.8)	7(16.7)	9(21.4)	24(57.1)	42	1.69	0.92
3	I use health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the management of diabetes	6(14.3)	11(26.2)	7(16.7)	18(42.9)	42	2.12	1.13

4	I use health information from magazines/newspaper/news magazines for the management of diabetes	11(26.2)	4(9.5)	12(28.6)	15(35.7)	42	2.26	1.21
5	I use health information from the Internet for the management of diabetes	20(47.6)	9(21.4)	6(14.3)	7(16.7)	42	3.00	1.15
6	I use health information from WhatsApp groups for the management of diabetes	17(40.5)	15(35.7)	4(9.5)	6(14.3)	42	3.02	1.05
7	I use health information from Facebook pages/Facebook groups for the management of diabetes	15(35.7)	4(9.5)	15(35.7)	8(19.0)	42	2.62	1.17
8	I use health information from Blogs for the management of diabetes	3(7.1)	3(7.1)	12(28.6)	24(57.1)	42	1.64	0.91
9	I use health information from Twitter for the management of diabetes	5(11.9)	4(9.5)	9(21.4)	24(57.1)	42	1.76	1.06
10	I use health information from Instagram for the management of diabetes	4(9.5)	11(26.2)	10(23.8)	17(40.5)	42	2.05	1.04
11	I use information from health professionals for the management of diabetes	8(19.0)	12(28.6)	15(35.7)	7(16.7)	42	2.50	0.99
12	I use health information from broadcast media (television, radio) for the management of diabetes	15(35.7)	11(26.2)	5(11.9)	11(26.2)	42	2.71	1.22
13	I use information from Diabetic Patients' Associations for the management of diabetes	4(9.5)	5(11.9)	13(31.0)	20(47.6)	42	1.83	0.98
14	I use information from family and friends for the management of diabetes	18(42.9)	6(14.3)	14(33.3)	4(9.5)	42	2.90	1.08
15	I use information seminars for diabetics for the management of diabetes	6(14.3)	3(7.1)	14(33.3)	19(45.2)	42	1.90	1.01
16	I use information from other patients with diabetes for the management of diabetes	16(38.1)	5(11.9)	9(21.4)	12(28.6)	42	2.60	1.27

Federal Medical Centre Lokoja, Kogi State

S/N	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I use health information from books for the management of diabetes	6(13.3)	9(20.0)	13(28.9)	17(37.8)	45	2.09	1.06
2	I use health information from journal articles for the management of diabetes	5(11.1)	7(15.6)	9(20.0)	24(53.3)	45	1.84	1.07
3	I use health information from booklets, brochures, leaflets, etc., from clinics or health professionals	16(35.6)	13(28.9)	6(13.3)	10(22.2)	45	2.78	1.17

	for the management of diabetes							
4	I use health information from magazines/newspaper/news magazines for the management of diabetes	20(44.4)	4(8.9)	9(20.0)	12(26.7)	45	2.71	1.29
5	I use health information from the Internet for the management of diabetes	20(44.4)	9(20.0)	9(20.0)	7(15.6)	45	2.93	1.14
6	I use health information from WhatsApp groups for the management of diabetes	15(33.3)	19(42.2)	5(11.1)	6(13.3)	45	2.95	0.99
7	I use health information from Facebook pages/Facebook groups for the management of diabetes	16(35.6)	7(15.6)	14(31.1)	8(17.8)	45	2.69	1.15
8	I use health information from Blogs for the management of diabetes	11(24.4)	14(31.1)	10(22.2)	10(22.2)	45	2.59	1.09
9	I use health information from Twitter for the management of diabetes	6(13.3)	6(13.3)	10(22.2)	23(51.1)	45	1.89	1.09
10	I use health information from Instagram for the management of diabetes	6(13.3)	11(24.4)	11(24.4)	17(37.8)	45	2.13	1.08
11	I use information from health professionals for the management of diabetes	8(17.8)	16(35.6)	15(33.3)	6(13.3)	45	2.58	0.94
12	I use health infor mation from broadcast media (television, radio) for the management of diabetes	12(26.7)	8(17.8)	10(22.2)	15(33.3)	45	2.38	1.21
13	I use information from Diabetic Patients' Associations for the management of diabetes	3(6.7)	8(17.8)	13(28.9)	21(46.7)	45	1.84	0.95
14	I use information from family and friends for the management of diabetes	16(35.6)	7(15.6)	17(37.8)	5(11.1)	45	2.76	1.07
15	I use information seminars for diabetics for the management of diabetes	6(13.3)	6(13.3)	18(40.0)	15(33.3)	45	2.07	1.00
16	I use information from other patients with diabetes for the management of diabetes	14(31.1)	10(22.2)	13(28.9)	8(17.8)	45	2.67	1.11

Federal Medical Centre Keffi, Nasarawa State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I use health information from books for the management of diabetes	6(17.1)	6(17.1)	11(31.4)	12(34.3)	35	2.17	1.09
2	I use health information from journal articles for the management of diabetes	3(8.6)	6(17.1)	10(28.6)	16(45.7)	35	1.89	0.99
3	I use health information from booklets, brochures, leaflets, etc.,	14(40.0)	7(20.0)	5(14.3)	9(25.7)	35	2.74	1.24

	from clinics or health professionals for the management of diabetes							
4	I use health information from magazines/newspaper/news magazines for the management of diabetes	7(20.0)	4(11.4)	13(37.1)	11(31.4)	35	2.20	1.11
5	I use health information from the Internet for the management of diabetes	11(31.4)	9(25.7)	9(25.7)	6(17.1)	35	2.71	1.10
6	I use health information from WhatsApp groups for the management of diabetes	11(31.4)	12(34.3)	9(25.7)	3(8.6)	35	2.89	0.97
7	I use health information from Facebook pages/Facebook groups for the management of diabetes	15(42.9)	7(20.0)	9(25.7)	4(11.4)	35	2.94	1.08
8	I use health information from Blogs for the management of diabetes	5(14.3)	1(2.9)	14(40.0)	15(42.9)	35	1.89	1.02
9	I use health information from Twitter for the management of diabetes	4(11.4)	4(11.4)	8(22.9)	19(54.3)	35	1.80	1.05
10	I use health information from Instagram for the management of diabetes	4(11.4)	6(17.1)	10(28.6)	15(42.9)	35	1.97	1.04
11	I use information from health professionals for the management of diabetes	7(20.0)	12(34.3)	12(34.3)	4(11.4)	35	2.63	0.94
12	I use health information from broadcast media (television, radio) for the management of diabetes	12(34.3)	11(31.4)	5(14.3)	7(20.0)	35	2.80	1.13
13	I use information from Diabetic Patients' Associations for the management of diabetes	3(8.6)	8(22.9)	10(28.6)	14(40.0)	35	2.00	1.00
14	I use information from family and friends for the management of diabetes	8(22.9)	9(25.7)	15(42.9)	3(8.6)	35	2.63	0.94
15	I use information seminars for diabetics for the management of diabetes	2(5.7)	3(8.6)	19(54.3)	11(31.4)	35	1.89	0.50
16	I use information from other patients with diabetes for the management of diabetes	13(37.1)	9(25.7)	6(17.1)	7(20.0)	35	2.80	1.16

Jos University Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I use health information from books for the management of diabetes	8(14.8)	14(25.9)	11(20.4)	21(38.9)	54	2.17	1.11
2	I use health information from journal articles for the management of diabetes	8(14.8)	9(16.7)	14(25.9)	23(42.6)	54	2.04	1.09
3	I use health information from booklets, brochures, leaflets, etc.,	19(35.2)	16(29.6)	9(16.7)	10(18.5)	54	2.81	1.12

	from clinics or health professionals for the management of diabetes							
4	I use health information from magazines/newspaper/news magazines for the management of diabetes	18(33.3)	4(7.4)	10(18.5)	22(40.7)	54	2.33	1.32
5	I use health information from the Internet for the management of diabetes	25(46.3)	9(16.7)	11(20.4)	9(16.7)	54	2.93	1.16
6	I use health information from WhatsApp groups for the management of diabetes	20(37.0)	18(33.3)	9(16.7)	7(13.0)	54	2.94	1.04
7	I use health information from Facebook pages/Facebook groups for the management of diabetes	22(40.7)	4(7.4)	15(27.8)	13(24.1)	54	2.65	1.24
8	I use health information from Blogs for the management of diabetes	17(31.5)	16(29.6)	11(20.4)	10(18.5)	54	2.74	1.02
9	I use health information from Twitter for the management of diabetes	7(13.0)	9(16.7)	14(25.9)	24(44.4)	54	1.98	1.07
10	I use health information from Instagram for the management of diabetes	7(13.0)	15(27.8)	13(24.1)	19(35.2)	54	2.19	0.31
11	I use information from health professionals for the management of diabetes	20(37.0)	22(40.7)	7(13.0)	5(9.3)	54	3.06	0.94
12	I use health information from broadcast media (television, radio) for the management of diabetes	6(11.1)	18(33.3)	4(7.4)	26(48.1)	54	2.07	1.13
13	I use information from Diabetic Patients' Associations for the management of diabetes	7(13.0)	8(14.8)	17(31.5)	22(40.7)	54	2.00	1.05
14	I use information from family and friends for the management of diabetes	25(46.3)	14(25.9)	9(16.7)	6(11.1)	54	3.07	1.13
15	I use information seminars for diabetics for the management of diabetes	10(18.5)	12(22.2)	14(25.9)	18(33.3)	54	2.26	1.12
16	I use information from other patients with diabetes for the management of diabetes	16(29.6)	14(25.9)	8(14.8)	16(29.6)	54	2.56	1.21

University of Abuja Teaching Hospital

S/N	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I use health information from books for the management of diabetes	7(11.5)	15(24.6)	12(19.7)	27(44.3)	61	2.03	1.08
2	I use health information from journal articles for the management of diabetes	8(13.1)	9(14.8)	18(29.5)	26(42.6)	61	1.98	1.06
3	I use health information from booklets, brochures, leaflets, etc.,	18(29.5)	21(34.4)	11(18.0)	11(18.0)	61	2.75	1.08

	from clinics or health professionals for the management of diabetes							
4	I use health information from magazines/newspaper/news magazines for the management of diabetes	23(37.7)	10(16.4)	16(26.2)	12(19.7)	61	2.72	1.17
5	I use health information from the Internet for the management of diabetes	29(47.5)	13(21.3)	11(18.0)	8(13.1)	61	3.03	1.10
6	I use health information from WhatsApp groups for the management of diabetes	16(26.2)	23(37.7)	8(13.1)	14(23.0)	61	2.67	1.01
7	I use health information from Facebook pages/Facebook groups for the management of diabetes	25(41.0)	5(8.2)	21(34.4)	10(16.4)	61	2.74	1.17
8	I use health information from Blogs for the management of diabetes	16(26.2)	20(32.8)	14(23.0)	11(18.0)	61	2.67	1.06
9	I use health information from Twitter for the management of diabetes	7(11.5)	9(14.8)	17(27.9)	28(45.9)	61	1.92	1.04
10	I use health information from Instagram for the management of diabetes	20(32.8)	18(29.5)	13(21.3)	10(16.4)	61	2.79	1.08
11	I use information from health professionals for the management of diabetes	18(29.5)	20(32.8)	8(13.1)	15(24.6)	61	2.67	1.15
12	I use health information from broadcast media (television, radio) for the management of diabetes	12(19.7)	18(29.5)	4(6.6)	27(44.3)	61	2.25	1.22
13	I use information from Diabetic Patients' Associations for the management of diabetes	16(26.2)	15(24.6)	18(29.5)	12(19.7)	61	2.57	1.09
14	I use information from family and friends for the management of diabetes	29(47.5)	16(26.2)	9(14.8)	7(11.5)	61	3.10	1.04
15	I use information seminars for diabetics for the management of diabetes	11(18.0)	17(27.9)	14(23.0)	19(31.1)	61	2.33	1.11
16	I use information from other patients with diabetes for the management of diabetes	16(26.2)	16(26.2)	10(16.4)	19(31.1)	61	2.48	1.19

University of Ilorin Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	I use health information from books for the management of diabetes	10(17.2)	13(22.4)	12(20.7)	23(39.7)	58	2.17	1.14
2	I use health information from journal articles for the management of diabetes	8(13.8)	8(13.8)	15(25.9)	27(46.6)	58	1.95	1.08
3	I use health information from booklets, brochures, leaflets, etc., from clinics or health professionals for the	19(32.8)	19(32.8)	12(20.7)	8(13.8)	58	2.84	1.04

	management of diabetes							
4	I use health information from magazines/newspaper/news magazines for the management of diabetes	20(34.5)	10(17.2)	16(27.6)	12(20.7)	58	2.66	1.16
5	I use health information from the Internet for the management of diabetes	25(43.1)	12(20.7)	10(17.2)	11(19.0)	58	2.88	1.17
6	I use health information from WhatsApp groups for the management of diabetes	17(29.3)	24(41.4)	8(13.8)	9(15.5)	58	2.84	1.02
7	I use health information from Facebook pages/Facebook groups for the management of diabetes	19(32.8)	7(12.1)	17(29.3)	15(25.9)	58	2.52	1.20
8	I use health information from Blogs for the management of diabetes	12(20.7)	13(22.4)	16(27.6)	17(29.3)	58	2.34	1.12
9	I use health information from Twitter for the management of diabetes	5(8.6)	11(19.0)	16(27.6)	26(44.8)	58	1.91	0.99
10	I use health information from Instagram for the management of diabetes	14(24.1)	14(24.1)	12(20.7)	18(31.0)	58	2.41	1.17
11	I use information from health professionals for the management of diabetes	22(27.9)	16(27.6)	7(12.1)	13(22.4)	58	2.81	1.18
12	I use health information from broadcast media (television, radio) for the management of diabetes	16(27.6)	18(31.0)	7(12.1)	17(29.3)	58	2.57	1.19
13	I use information from Diabetic Patients' Associations for the management of diabetes	10(17.2)	13(22.4)	14(24.1)	21(36.2)	58	2.21	1.12
14	I use information from family and friends for the management of diabetes	22(37.9)	14(24.1)	9(15.5)	13(22.4)	58	2.78	1.19
15	I use information seminars for diabetics for the management of diabetes	14(24.1)	13(22.4)	17(29.3)	14(24.1)	58	2.47	1.11
16	I use information from other patients with diabetes for the management of diabetes	11(19.0)	14(24.1)	9(15.5)	24(41.4)	58	2.21	1.18

Research Question 4: What is the frequency of usage of health information for the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central Nigeria?

Federal Medical Centre Bida, Niger State

S/No	Statement	MTD 5	Daily 4	Weekly 3	Monthly 2	Quarterly 1	n	$\bar{X}$	StD
1	Books	2(5.3)	3(7.9)	6(15.8)	9(23.7)	18(47.4)	38	2.00	1.21
2	Journal articles	1(2.6)	3(7.9)	11(28.9)	8(21.1)	15(39.5)	38	2.13	1.12

3	Booklets, brochures, leaflets, etc., from clinic or health professionals	5(13.2)	13(34.2)	8(21.1)	6(16.8)	6(15.8)	38	3.13	1.30
4	Magazines/newspaper/news magazines	3(7.9)	3(7.9)	6(15.8)	6(15.8)	20(52.6)	38	2.03	1.32
5	Internet	7(18.4)	11(28.9)	6(15.8)	9(23.7)	5(13.2)	38	3.16	1.35
6	WhatsApp groups	9(23.7)	10(26.3)	4(10.5)	9(23.7)	6(15.8)	38	3.18	1.45
7	Facebook pages/Facebook groups	11(28.9)	7(18.4)	2(5.3)	8(21.1)	10(26.3)	38	3.03	1.64
8	Blogs	3(7.9)	1(2.6)	3(7.9)	7(18.4)	24(63.2)	38	1.74	1.22
9	Twitter	1(2.6)	9(23.7)	5(13.2)	8(21.1)	15(39.5)	38	2.29	1.29
10	Instagram	2(5.3)	9(23.7)	5(13.2)	7(18.4)	15(39.5)	38	2.37	1.36
11	Health professionals	2(5.3)	14(36.8)	6(15.8)	12(31.6)	4(10.5)	38	2.95	1.16
12	Broadcast media (television, radio)	3(7.9)	6(15.8)	6(15.8)	7(18.4)	16(42.1)	38	2.29	1.37
13	Diabetic Patients' Associations	0	4(10.5)	13(34.2)	5(13.2)	16(42.1)	38	2.13	1.10
14	Family and friends	4(10.5)	9(23.7)	17(44.7)	4(10.5)	4(10.5)	38	3.13	1.09
15	Seminars for diabetics	0	7(18.4)	15(39.5)	5(13.2)	11(28.9)	38	2.47	1.11
16	Other patients with diabetes	0	2(5.3)	11(28.9)	6(15.8)	19(50.0)	38	1.89	1.00

Federal Medical Centre Makurdi, Benue State

S/N	Statement	MTD 5	Daily 4	Weekly 3	Monthly 2	Quarterly 1	n	$\bar{X}$	StD
1	Books	3(7.1)	3(7.1)	5(11.9)	13(31.0)	18(42.9)	42	2.05	1.23
2	Journal articles	4(9.5)	3(7.1)	8(19.0)	8(19.0)	19(45.2)	42	2.17	1.34
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	5(11.9)	15(35.7)	6(14.3)	10(23.8)	6(14.3)	42	3.07	1.30
4	Magazines/newspaper/news magazines	3(7.1)	6(14.3)	6(14.3)	7(16.7)	20(47.6)	42	2.17	1.36
5	Internet	15(35.7)	11(26.2)	6(14.3)	4(9.5)	6(14.3)	42	3.60	1.43
6	WhatsApp groups	12(28.6)	6(14.3)	6(14.3)	12(28.6)	6(14.3)	42	3.14	1.48

7	Facebook pages/Facebook groups	18(42.9)	7(16.7)	1(2.4)	8(19.0)	8(19.0)	42	3.45	1.64
8	Blogs	3(7.1)	1(2.4)	2(4.8)	9(21.4)	27(64.3)	42	1.67	1.16
9	Twitter	1(2.4)	8(19.0)	5(11.9)	13(31.0)	15(35.7)	42	2.21	1.20
10	Instagram	2(4.8)	11(26.2)	5(11.9)	9(21.4)	15(35.7)	42	2.43	1.36
11	Health professionals	9(21.4)	16(38.1)	4(9.5)	9(21.4)	4(9.5)	42	3.40	1.31
12	Broadcast media (television, radio)	10(23.8)	13(31.0)	6(14.3)	4(9.5)	9(21.4)	42	3.26	1.48
13	Diabetic Patients' Associations	2(4.8)	4(9.5)	12(28.6)	5(11.9)	19(45.2)	42	2.17	1.25
14	Family and friends	7(16.7)	7(16.7)	17(40.5)	4(9.5)	7(16.7)	42	3.07	1.28
15	Seminars for diabetics		6(14.3)	14(33.3)	7(16.7)	3(7.1)	42	2.26	1.11
16	Other patients with diabetes	18(42.9)	5(11.9)	6(14.3)	3(7.1)	10(23.8)	42	3.43	1.655

Federal Medical Centre, Lokoja, Kogi State

S/N	Statement	MTD 5	Daily 4	Weekly 3	Monthly 2	Quarterly 1	n	$\bar{X}$	StD
1	Books	3(6.7)	5(11.1)	5(11.1)	11(24.4)	21(46.7)	45	2.07	1.29
2	Journal articles	4(8.9)	3(6.7)	8(17.8)	8(17.8)	22(48.9)	45	2.09	1.33
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	14(31.1)	17(37.8)	3(6.7)	7(15.6)	4(8.9)	45	3.67	1.31
4	Magazines/newspaper/news magazines	3(6.7)	6(13.3)	6(13.3)	9((20.0)	21(46.7)	45	2.13	1.33
5	Internet	15(33.3)	11(24.4)	6(13.3)	4(8.9)	9((20.0)	45	3.42	1.53
6	WhatsApp groups	13(28.9)	7(15.6)	6(13.3)	13(28.9)	6(13.3)	45	3.18	1.45
7	Facebook pages/Facebook groups	20(44.4)	6(13.3)	0(0)	12(26.7)	7(15.6)	45	3.44	1.63
8	Blogs	18(40.0)	8(17.8)	5(11.1)	5(11.1)	9((20.0)	45	3.47	1.59
9	Twitter	4(8.9)	7(15.6)	5(11.1)	16(35.6)	13(28.9)	45	2.40	2.58
10	Instagram	4(8.9)	11(24.4)	5(11.1)	12(26.7)	13(28.9)	45	2.58	1.37

11	Health professionals	10(22.2)	15(33.3)	4(8.9)	7(15.6)	9((20.0)	45	3.22	1.47
12	Broadcast media (television, radio)	5(11.1)	11(24.4)	5(11.1)	12(26.7)	12(26.7)	45	2.67	1.39
13	Diabetic Patients' Associations	2(4.4)	4(8.9)	13(28.9)	5(11.1)	21(46.7)	45	2.13	1.24
14	Family and friends	10(22.2)	12(26.7)	16(35.6)	3(6.7)	4(8.9)	45	3.47	1.18
15	Seminars for diabetics		5(11.1)	11(24.4)	15(33.3)	14(31.1)	45	2.16	0.99
16	Other patients with diabetes	21(46.7)	5(11.1)	8(17.8)	3(6.7)	8(17.8)	45	3.62	1.56

Federal Medical Centre, Keffi, Nasarawa State

S/N	Statement	MTD 5	Daily 4	Weekly 3	Monthly 2	Quarterly 1	n	$\bar{X}$	StD
1	Books	5(14.3)	3(8.6)	3(8.6)	10 (28.6)	14(40.0)	35	2.29	1.45
2	Journal articles	4(11.4)	4(11.4)	7(20.0)	7(20.0)	13(37.1)	35	2.40	1.39
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	2(5.7)	5(14.3)	3(8.6)	10(28.6)	15(42.9)	35	2.11	1.28
4	Magazines/newspaper/news magazines	2(5.7)	7(20.0)	7(20.0)	6(17.1)	13(37.1)	35	2.40	1.33
5	Internet	12(34.3)	9(25.7)	4(11.4)	6(17.1)	4(11.4)	35	3.54	1.42
6	WhatsApp groups	8(22.9)	7(20.0)	7(20.0)	8(22.9)	5(14.3)	35	3.14	1.39
7	Facebook pages/Facebook groups	11(31.4)	6(17.1)	5(14.3)	5(14.3)	8(22.9)	35	3.20	1.59
8	Blogs	3(8.6)	3(8.6)	2(5.7)	5(14.3)	22(62.9)	35	1.86	1.35
9	Twitter	1(2.9)	5(14.3)	6(17.1)	9(25.7)	14(40.0)	35	2.14	1.19
10	Instagram	2(5.7)	6(17.1)	6(17.1)	8(22.9)	13(37.1)	35	2.31	1.30
11	Health professionals	7(20.0)	11(31.4)	6(17.1)	7(20.0)	4(11.4)	35	3.29	1.32
12	Broadcast media (television, radio)	7(20.0)	6(17.1)	2(5.7)	6(17.1)	14(40.0)	35	2.60	1.63
13	Diabetic Patients' Associations	2(5.7)	3(8.6)	10(28.6)	6(17.1)	14(40.0)	35	2.23	1.24
14	Family and friends	7(20.0)	7(20.0)	14(40.0)	3(8.6)	4(11.4)	35	3.29	1.24
15	Seminars for diabetics		5(14.3)	9(25.7)	7(20.0)	14(40.0)	35	2.14	1.12
16	Other patients with diabetes	11(31.4)	3(8.6)	6(17.1)	6(17.1)	9(25.7)	35	3.03	1.62

JOS University Teaching Hospital

S/N	Statement	MTD 5	Daily 4	Weekly 3	Monthly 2	Quarterly 1	n	$\bar{X}$	StD
1	Books	2(3.7)	7(13.0)	7(13.0)	12(22.2)	26(48.1)	54	2.02	1.22
2	Journal articles	1(1.9)	4(7.4)	14(25.9)	16(29.6)	19(35.2)	54	2.11	1.04
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	8(14.8)	22(40.7)	9(16.7)	9(16.7)	6(11.1)	54	3.31	1.24
4	Magazines/newspaper /news magazines	4(7.4)	4(7.4)	11(20.4)	15(27.8)	20(37.0)	54	2.20	1.23
5	Internet	16(29.6)	16(29.6)	9(16.7)	8(14.8)	5(9.3)	54	3.56	1.31
6	WhatsApp groups	15(27.8)	13(24.1)	6(11.1)	11(20.4)	9(16.7)	54	3.26	1.48
7	Facebook pages/Facebook groups	21(38.9)	12(22.2)	7(13.0)	4(7.4)	10(18.5)	54	3.57	1,52
8	Blogs	24(44.4)	7(13.0)	7(13.0)	8(14.8)	8(14.8)	54	3.56	1.54
9	Twitter	1(1.9)	11(20.4)	5(9.3)	15(27.8)	22(40.7)	54	2.15	1.22
10	Instagram	7(13.0)	12(22.2)	5(9.3)	11(20.4)	19(35.2)	54	2.57	1.48
11	Health professionals	9(16.7)	18(33.3)	9(16.7)	13(24.1)	5(9.3)	54	3.24	1.26
12	Broadcast media (television, radio)	3(5.6)	11(20.4)	8(14.8)	14(25.9)	18(33.3)	54	2.39	1.29
13	Diabetic Patients' Associations	6(11.1)	5(9.3)	16(29.6)	10(18.5)	17(31.5)	54	2.50	1.32
14	Family and friends	10(18.5)	8(14.8)	21(38.9)	4(7.4)	11(20.4)	54	3.04	1.35
15	Seminars for diabetics	9(16.7)	13(24.1)	12(22.2)	3(5.6)	17(31.5)	54	2.89	1.50
16	Other patients with diabetes	10(18.5)	11(20.5)	11(20.5)	6(11.1)	16(29.6)	54	2.87	1.50

University of Abuja Teaching Hospital

S/N	Statement	MTD 5	Daily 4	Weekly 3	Monthly 2	Quarterly 1	n	$\bar{X}$	StD
1	Books	2(3.3)	7(11.5)	10(16.4)	12(19.7)	30(49.2)	61	2.00	1.20
2	Journal articles	1(1.6)	5(8.2)	17(27.9)	16(26.2)	22(36.1)	61	2.13	1.06
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	10(16.4)	24(39.3)	14(23.0)	9(14.8)	4(6.6)	61	3.44	1.13
4	Magazines/newspaper/news magazines	4(6.6)	5(8.2)	13(21.3)	17(27.9)	22(36.1)	61	2.21	1.21
5	Internet	17(27.9)	16(26.2)	9(14.8)	9(14.8)	10(16.4)	61	3.34	1.45
6	WhatsApp groups	16(26.2)	16(26.2)	6(9.8)	12(19.7)	11(18.0)	61	3.23	1.49
7	Facebook pages/Facebook groups	23(37.7)	12(19.7)	7(11.5)	6(9.8)	13(21.3)	61	3.43	1.59
8	Blogs	23(37.7)	11(18.0)	10(16.4)	10(16.4)	7(11.5)	61	3.54	1.43
9	Twitter	4(6.6)	9(14.8)	10(16.4)	16(26.2)	22(36.1)	61	2.30	1.28
10	Instagram	11(18.0)	19(31.1)	8(13.1)	11(18.0)	12(19.7)	61	3.10	1.42
11	Health professionals	7(11.5)	20(32.8)	11(18.0)	18(29.5)	5(8.2)	61	3.10	1.19
12	Broadcast media (television, radio)	7(11.5)	12(19.7)	7(11.5)	15(24.6)	20(32.8)	61	2.52	1.42
13	Diabetic Patients' Associations	6(9.8)	8(13.1)	18(29.5)	7(11.5)	22(36.1)	61	2.49	1.39
14	Family and friends	12(19.7)	12(19.7)	22(36.1)	5(8.2)	10(16.4)	61	3.18	1.31
15	Seminars for diabetics	6(9.8)	9(14.8)	13(21.3)	4(6.6)	29(47.5)	61	2.33	1.45
16	Other patients with diabetes	13(21.3)	13(21.3)	12(19.7)	6(9.8)	17(27.9)	61	2.98	1.52

University of Ilorin Teaching Hospital

S/N	Statement	MTD 5	Daily 4	Weekly 3	Monthly 2	Quarterly 1	n	$\bar{X}$	StD
1	Books	4(6.9)	7(12.1)	9(15.5)	13(22.4)	25(43.1)	58	2.17	1.30
2	Journal articles	3(5.2)	4(6.9)	15(25.9)	13(22.4)	23(39.7)	58	2.16	1.18
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	13(22.4)	19(32.8)	11(19.0)	9(15.5)	6(10.3)	58	3.41	1.26
4	Magazines/newspaper/ news magazines	13(22.4)	16(27.6)	7(12.1)	16(27.6)	6(10.3)	58	3.24	1.36
5	Internet	14(24.1)	17(29.3)	6(10.3)	12(20.7)	9(15.5)	58	3.26	1.43
6	WhatsApp groups	17(29.3)	14(24.1)	8(13.8)	11(19.0)	8(13.8)	58	3.36	1.44
7	Facebook pages/Facebook groups	20(34.5)	12(20.7)	7(12.1)	6(10.3)	13(22.4)	58	3.34	1.58
8	Blogs	12(20.7)	7(12.1)	16(27.6)	10(17.2)	13(22.4)	58	2.91	1.43
9	Twitter	3(5.2)	8(13.8)	13(22.4)	21(36.2)	13(22.4)	58	2.43	1.14
10	Instagram	7(12.1)	14(24.1)	6(10.3)	11(19.0)	20(34.5)	58	2.60	1.47
11	Health professionals	5(8.6)	19(32.8)	12(20.7)	15(25.9)	7(12.1)	58	3.00	1.20
12	Broadcast media (television, radio)	11(19.0)	16(27.6)	7(12.1)	12(20.7)	12(20.7)	58	3.03	1.45
13	Diabetic Patients' Associations	10(17.2)	7(12.1)	16(27.6)	8(13.8)	17(29.3)	58	2.74	1.45
14	Family and friends	11(19.0)	10(17.2)	19(32.8)	5(8.6)	13(22.4)	58	3.02	1.40
15	Seminars for diabetics	14(24.1)	17(29.3)	10(17.2)	8(13.8)	9(15.5)	58	3.33	1.39
16	Other patients with diabetes	8(13.8)	10(17.2)	14(24.1)	10(17.2)	16(27.6)	58	2.72	1.40

Research Question 5: What is the health information literacy skill for the management of diabetes mellitus by diabetic patients in tertiary health facilities in North Central, Nigeria?

Federal Medical Centre Bida

S/N	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	I have computer and Internet navigation skills	2(5.3)	5(13.2)	10(26.3)	21(55.3)	35	1.68	0.9
2	I have the skills in sharing health information across various platforms	5(13.2)	4(10.5)	7(18.4)	22(57.9)	35	1.79	1.09
3	I have the skills to identify health information sources	13(34.2)	3(7.9)	13(34.2)	9(23.7)	35	2.53	1.20
4	I have the skills to recognize my health information needs	12(31.6)	9(23.7)	12(31.6)	5(13.2)	35	2.74	1.06
5	I have the skills to assess quality health information	7(18.4)	6(15.8)	8(21.1)	17(44.7)	35	2.08	1.17
6	I have the skills to retrieve health information resources	14(36.8)	7(18.4)	11(28.9)	6(15.8)	35	2.76	1.12
7	I have the skills on how to use health information to make a good decision	11(28.9)	8(21.1)	9(23.7)	10(26.3)	35	2.53	1.18

Federal Medical Centre, Keffi, Nasarawa State

S/N	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	I have computer and Internet navigation skills	15(42.9)	7(20.0)	8(22.9)	5(14.3)	35	2.91	1.12
2	I have the skills in sharing health information across various platforms	14(40.0)	5(14.3)	5(14.3)	11(31.4)	35	2.63	1.31
3	I have the skills to identify health information sources	13(37.1)	4(11.4)	13(37.1)	5(14.3)	35	2.71	1.13
4	I have the skills to recognize my health information needs	13(37.1)	5(14.3)	15(42.9)	2(5.7)	35	2.83	1.01
5	I have the skills to assess quality health information	11(31.4)	5(14.3)	11(31.4)	8(22.9)	35	2.54	1.72
6	I have the skills to retrieve health information resources	5(14.3)	4(11.4)	14(40.0)	12(34.3)	35	2.06	1.03
7	I have the skills on how to use health information to make a good decision	8(22.9)	15(42.9)	6(17.1)	6(17.1)	35	2.71	1.02

Federal Medical Centre, Makurdi

S/No	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	I have computer and Internet navigation skills	15(35.7)	13(31.0)	6(14.3)	8(19.0)	42	2.83	1.12
2	I have the skills in sharing health information across various platforms	16(38.1)	4(9.5)	8(19.0)	14(33.3)	42	2.52	1.31
3	I have the skills to identify health information sources	16(38.1)	5(11.9)	14(33.3)	7(16.7)	42	2.71	1.15
4	I have the skills to recognize my health information needs	16(38.1)	12(28.6)	7(16.7)	7(16.7)	42	2.88	1.11
5	I have the skills to assess quality health information	12(28.6)	10(23.8)	8(19.0)	12(28.6)	42	2.52	1.19
6	I have the skills to retrieve health information resources	14(33.3)	5(11.9)	18(42.9)	5(11.9)	42	2.67	1.07
7	I have the skills on how to use health information to make a good decision	11(26.2)	15(35.7)	10(23.8)	6(14.3)	42	2.74	1.09

University Of Ilorin Teaching Hospital

University of Ilorin Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	I have computer and Internet navigation skills	16(27.6)	9(15.5)	26(44.8)	7(12.1)	58	2.59	1.03
2	I have the skills in sharing health information across various platforms	18(31.0)	17(29.3)	11(29.3)	12(20.7)	58	2.71	1.12
3	I have the skills to identify health information sources	15(25.9)	11(19.0)	22(37.9)	10(17.2)	58	2.53	1.06
4	I have the skills to recognize my health information needs	13(22.4)	23(39.7)	16(27.6)	6(10.3)	58	2.74	0.93
5	I have the skills to assess quality health information	17(29.3)	13(22.4)	17(29.3)	11(19.0)	58	2.62	1.10
6	I have the skills to retrieve health information resources	13(22.4)	16(27.6)	17(29.3)	12(20.7)	58	2.52	1.06
7	I have the skills on how to use health information to make a good decision	17(29.3)	18(31.0)	17(29.3)	6(10.3)	58	2.79	0.99

University of Abuja Teaching Hospital

University of Abuja Teaching Hospital

University of Abuja Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	I have computer and Internet navigation skills	18(29.5)	21(34.4)	11(18.0)	11(18.0)	61	2.75	1.08
2	I have the skills in sharing health information across various platforms	16(26.2)	15(24.6)	18(29.5)	12(19.7)	61	2.57	1.09
3	I have the skills to identify health information sources	18(29.5)	20(32.8)	8(13.1)	15(24.6)	61	2.67	1.15
4	I have the skills to recognize my health information needs	16(26.2)	20(32.8)	10(16.4)	15(24.6)	61	2.61	1.13
5	I have the skills to assess quality health information	15(24.6)	11(18.0)	13(21.3)	22(36.1)	61	2.31	1.21
6	I have the skills to retrieve health information resources	19(31.1)	17(27.9)	14(23.0)	11(18.0)	61	2.72	1.09
7	I have the skills on how to use health information to make a good decision	27(44.3)	10(16.4)	9(14.8)	15(24.6)	61	2.80	1.25

Jos University Teaching Hospital

S/N	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	I have computer and Internet navigation skills	18(33.3)	9(16.7)	17(31.5)	10(18.5)	54	2.65	1.13
2	I have the skills in sharing health information across various platforms	15(27.8)	12(22.2)	12(22.2)	15(27.8)	54	2.50	1.18
3	I have the skills to identify health information sources	18(33.3)	5(9.3)	20(37.0)	11(20.4)	54	2.56	1.16
4	I have the skills to recognize my health information needs	13(24.1)	15(27.8)	16(29.6)	10(18.5)	54	2.57	1.06
5	I have the skills to assess quality health information	16(29.6)	13(24.1)	14(25.9)	11(20.4)	54	2.63	1.12
6	I have the skills to retrieve health information resources	14(25.9)	7(13.0)	12(22.2)	21(38.9)	54	2.26	1.23
7	I have the skills on how to use health information to make a good decision	18(33.3)	13(24.1)	17(31.5)	6(11.1)	54	2.80	1.03
	Weighted Mean							

Federal Medical Center Lokoja

Federal Medical Centre Lokoja, Kogi State

S/No	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	I have computer and Internet navigation skills	13(28.9)	13(28.9)	8(17.8)	11(24.4)	45	2.62	1.15
2	I have the skills in sharing health information across various platforms	16(35.6)	11(24.4)	9(20.0)	9(20.0)	45	2.76	1.51
3	I have the skills to identify health information sources	16(35.6)	8(17.8)	14(31.1)	7(15.6)	45	2.73	1.12
4	I have the skills to recognize my health information needs	12(26.7)	13(28.9)	10(22.2)	10(22.2)	45	2.60	1.12
5	I have the skills to assess quality health information	14(31.1)	7(15.6)	14(31.1)	10(22.2)	45	2.56	1.16
6	I have the skills to retrieve health information resources	11(24.4)	6(13.3)	11(24.4)	17(37.8)	45	2.24	1.21
7	I have the skills on how to use health information to make a good decision	11(24.4)	16(35.6)	12(26.7)	6(13.3)	45	2.71	0.99

Research Question 6: What is the level of satisfaction derived from the use of health information by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

Federal Medical Centre Bida

S/No	Statement	VS 4	S 3	D 2	VD 1	N	$\bar{X}$	StD
1	Books	2(5.3)	4(10.5)	11(28.9)	21(55.3)	38	1.66	0.88
2	Journal articles	4(10.5)	8(21.1)	11(28.9)	15(39.5)	38	2.03	1.03
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	3(7.9)	6(15.8)	6(15.8)	23(60.5)	38	1.71	1.01
4	Magazines/newspaper/news magazine	3(7.9)	7(18.4)	9(23.7)	19(50.0)	38	1.84	1.00
5	Internet	13(34.2)	6(15.8)	9(23.7)	10(26.3)	38	2.58	1.22
6	WhatsApp groups	15(39.5)	13(34.2)	4(10.5)	7(18.4)	38	2.97	1.08
7	Facebook pages/Facebook groups	13(34.2)	6(15.8)	12(31.6)	7(18.4)	38	2.66	1.15
8	Blogs	5(13.2)	5(13.2)	10(26.3)	18(47.4)	38	1.92	1.08

9	Twitter	4(10.5)	8(21.1)	2(5.3)	24(63.2)	38	1.79	1.12
10	Instagram	2(5.3)	9(23.7)	11(28.9)	16(42.1)	38	1.92	0.94
11	Health professionals	16(42.1)	3(7.9)	10(26.3)	9(23.7)	38	2.68	1.25
12	Broadcast media (television, radio)	6(15.8)	10(26.3)	9(23.7)	13(34.2)	38	2.24	1.10
13	Diabetic Patients' Associations	6(15.8)	7(18.4)	1(2.6)	24(63.2)	38	1.87	1.21
14	Family and friends	10(26.3)	8(21.1)	13(34.2)	7(18.4)	38	2.55	1.08
15	Seminars for diabetics	6(15.8)	11(28.9)	2(5.3)	19(50.0)	38	2.11	1.20
16	Other patients with diabetes	17(44.7)	9(23.7)	4(10.5)	8(21.1)		2.92	1.19

Federal Medical Centre Keffi, Nasarawa State

S/No	Statement	VS 4	S 3	D 2	VD 1	N	$\bar{X}$	StD
1	Books	5(14.3)	4(11.4)	13(37.1)	13(37.1)	35	2.03	1.04
2	Journal articles	4(11.4)	6(17.1)	11(31.4)	14(40.0)	35	2.00	1.03
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	5(14.3)	10(28.6)	9(25.7)	11(31.4)	35	2.26	1.07
4	Magazines/newspaper/news magazine	6(17.1)	5(14.3)	7(20.0)	9(25.7)	35	2.00	1.16
5	Internet	11(31.4)	8(22.9)	7(20.0)	9(25.7)	35	2.60	1.19
6	WhatsApp groups	9(25.7)	16(45.7)	4(11.4)	6(17.1)	35	2.80	1.03
7	Facebook pages/Facebook groups	11(31.4)	8(22.9)	11(31.4)	5(14.3)	35	2.71	1.07
8	Blogs	5(14.3)	3(8.6)	15(42.9)	12(34.3)	35	2.03	1.01
9	Twitter	2(5.7)	8(22.9)	7(20.0)	18(51.4)	35	1.83	0.98
10	Instagram	3(8.6)	7(20.0)	12(34.3)	13(37.1)	35	2.00	0.97
11	Health professionals	17(48.6)	3(8.6)	8(22.9)	7(20.0)	35	2.86	1.24
12	Broadcast media (television, radio)	8(22.9)	7(20.0)	9(25.7)	11(31.4)	35	2.34	1.16

13	Diabetic Patients' Associations	4(11.4)	6(17.1)	8(22.9)	17(48.6)	35	1.91	1.07
14	Family and friends	11(31.4)	9(25.7)	9(25.7)	6(17.1)	35	2.71	1.10
15	Seminars for diabetics	3(8.6)	8(22.9)	8(22.9)	16(45.7)	35	1.94	1.03
16	Other patients with diabetes	12(34.3)	10(28.6)	3(8.6)	10(28.6)	35	2.69	1.23

Federal Medical Centre Markurdi, Benue State

S/No	Statement	VS 4	S 3	D 2	VD 1	N	$\bar{X}$	StD
1	Books	4(9.5)	4(9.5)	20(47.6)	14(33.3)	42	1.95	0.90
2	Journal articles	3(7.1)	10(23.8)	16(38.1)	13(31.0)	42	2.07	0.92
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	14(33.3)	11(26.2)	6(14.3)	11(26.2)	42	2.67	1.20
4	Magazines/newspaper/news magazine	6(14.3)	6(14.3)	6(14.3)	24(57.1)	42	1.86	1.14
5	Internet	15(35.7)	9(21.4)	9(21.4)	9(21.4)	42	2.71	
6	WhatsApp groups	13(31.0)	16(38.1)	6(14.3)	7(16.7)	42	3.83	1.06
7	Facebook pages/Facebook groups	13(31.0)	10(23.8)	10(23.8)	9(21.4)	42	2.64	1.14
8	Blogs	5(11.9)	5(11.9)	18(42.9)	14(33.3)	42	2.02	0.98
9	Twitter	4(9.5)	8(19.0)	8(19.0)	22(52.4)	42	1.86	1.05
10	Instagram	2(4.8)	8(19.0)	15(35.7)	17(40.5)	42	1.88	0.89
11	Health professionals	21(50.0)	2(4.8)	11(26.2)	8(19.0)	42	2.86	1.24
12	Broadcast media (television, radio)	11(26.2)	12(28.6)	8(19.0)	11(26.2)	42	2.55	1.15
13	Diabetic Patients' Associations	5(11.9)	6(14.3)	5(11.9)	26(61.9)	42	1.76	1.10
14	Family and friends	14(33.3)	8(19.0)	15(35.7)	5(11.9)	42	2.74	1.06
15	Seminars for diabetics	4(9.5)	13(31.0)	1(2.4)	24(57.1)	42	1.93	1.14
16	Other patients with diabetes	19(45.2)	12(28.6)	1(2.4)	10(23.8)	42	2.95	1.209

Federal Medical Centre, Lokoja, Kogi State

Federal Medical Centre Lokoja, Kogi State

S/No	Statement	VS 4	S 3	D 2	VD 1	N	$\bar{X}$	StD
1	Books	8(17.8)	4(8.9)	18(40.0)	15(33.3)	45	2.11	1.07
2	Journal articles	6(13.3)	6(13.3)	14(31.1)	9(20.0)	45	1.98	1.05
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	14(31.1)	11(31.1)	9(20.0)	11(31.1)	45	2.62	1.17
4	Magazines/newspaper/news magazine	10(22.2)	17(37.8)	5(11.1)	13(28.9)	45	2.53	1.14
5	Internet	26(57.8)	8(17.8)	(17.8)	3(6.7)	45	3.27	0.98
6	WhatsApp groups	19(42.2)	13(28.9)	6(13.3)	7(15.6)	45	2.98	1.09
7	Facebook pages/Facebook groups	19(42.2)	10(22.2)	10(22.2)	6(13.3)	45	2.93	1.09
8	Blogs	19(42.2)	3(6.7)	12(26.7)	11(24.4)	45	2.67	1.26
9	Twitter	4(8.9)	8(17.8)	12(26.7)	21(46.7)	45	1.89	1.00
10	Instagram	2(4.4)	7(15.6)	15(33.3)	21(46.7)	45	1.78	0.87
11	Health professionals	22(48.9)	5(11.1)	10(22.2)	8(17.8)	45	2.91	1.20
12	Broadcast media (television, radio)	13(28.9)	14(31.1)	7(15.6)	11(24.4)	45	2.64	1.15
13	Diabetic Patients' Associations	7(15.6)	6(13.3)	10(22.2)	22(48.9)	45	1.96	1.13
14	Family and friends	11(24.4)	12(26.7)	18(40.0)	4(8.9)	45	2.67	0.95
15	Seminars for diabetics	11(24.4)	12(26.7)	4(8.9)	25(55.6)	45	1.87	1.06
16	Other patients with diabetes	19(42.2)	10(22.2)	8(17.8)	8(17.8)	45	2.89	1.15

Jos University Teaching Hospital

S/No	Statement	VS 4	S 3	D 2	VD 1	N	$\bar{X}$	StD
1	Books	7(13.0)	5(9.3)	13(24.1)	29(53.7)	54	1.81	1.06
2	Journal articles	4(7.4)	8(14.8)	20(37.0)	22(22.2)	54	1.89	0.93
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	12(22.2)	20(37.0)	7(13.0)	15(27.8)	54	2.54	1.13
4	Magazines/newspaper/news magazine	3(5.6)	8(14.8)	14(25.9)	29(53.7)	54	1.72	0.92
5	Internet	26(48.1)	9(16.7)	10(18.5)	9(16.7)	54	2.96	1.16
6	WhatsApp groups	20(37.0)	21(38.9)	6(11.1)	7(13.0)	54	3.00	1.00
7	Facebook pages/Facebook groups	16(29.6)	10(18.5)	20(37.0)	8(14.8)	54	2.63	1.07
8	Blogs	16(29.6)	15(27.8)	11(20.4)	12(22.2)	54	2.65	1.14
9	Twitter	8(14.8)	10(18.5)	3(5.6)	33(61.1)	54	1.87	1.18
10	Instagram	6(11.1)	12(22.2)	15(27.8)	21(38.9)	54	2.06	1.04
11	Health professionals	21(38.9)	9(16.7)	14(25.9)	10(18.5)	54	2.76	1.16
12	Broadcast media (television, radio)	8(14.8)	18(33.3)	12(22.2)	16(29.6)	54	2.33	1.06
13	Diabetic Patients' Associations	11(20.4)	11(20.4)	6(11.1)	26(48.1)	54	2.13	1.22
14	Family and friends	20(37.0)	11(20.4)	16(29.6)	7(13.0)	54	2.81	1.08
15	Seminars for diabetics	9(16.7)	17(31.5)	9(16.7)	19(35.2)	54	2.30	1.13
16	Other patients with diabetes	13(24.1)	13(24.1)	10(18.5)	18(33.3)	54	2.39	1.18

University of Abuja Teaching Hospital

S/No	Statement	VS 4	S 3	D 2	VD 1	N	$\bar{X}$	StD
1	Books	11(18.0)	4(6.6)	13(21.3)	33(54.1)	61	1.89	1.16
2	Journal articles	9(14.8)	8(13.1)	18(29.5)	26(42.6)	61	2.00	1.08
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	8(13.1)	17(27.9)	12(19.7)	24(39.3)	61	2.15	1.09
4	Magazines/newspaper/news magazine	15(24.6)	11(18.0)	13(21.3)	22(36.1)	61	2.31	1.21
5	Internet	19(31.1)	18(29.5)	10(16.4)	14(23.0)	61	2.69	1.15
6	WhatsApp groups	19(31.1)	24(39.3)	12(19.7)	6(9.8)	61	2.92	0.95
7	Facebook pages/Facebook groups	22(36.1)	12(19.7)	21(34.4)	6(9.8)	61	2.82	1.04
8	Blogs	19(31.1)	17(27.9)	14(23.0)	11(18.0)	61	2.72	1.09
9	Twitter	8(13.1)	12(19.7)	7(11.5)	34(55.7)	61	1.90	1.14
10	Instagram	6(9.8)	14(23.0)	17(27.9)	24(39.3)	61	2.03	1.02
11	Health professionals	23(37.7)	12(19.7)	16(26.2)	10(16.4)	61	2.79	1.23
12	Broadcast media (television, radio)	10(16.4)	20(32.8)	15(24.6)	16(26.2)	61	2.39	1.05
13	Diabetic Patients' Associations	21(34.4)	11(18.0)	2(3.3	27(44.3)	61	2.43	1.36
14	Family and friends	18(29.5)	15(24.6)	20(32.8)	8(13.1)	61	2.70	1.04
15	Seminars for diabetics	11(18.0)	20(32.8)	14(23.0)	16(26.3)	61	2.43	1.07
16	Other patients with diabetes	16(26.2)	20(32.8)	10(16.4)	15(24.6)	61	2.61	1.13

University of Ilorin Teaching Hospital

S/No	Statement	VS 4	S 3	D 2	VD 1	N	$\bar{X}$	StD
1	Books	14(24.1)	2(3.4)	16(27.6)	26(44.8)	58	2.07	1.21
2	Journal articles	9(15.5)	7(12.1)	24(41.4)	18(31.00	58	2.12	1.03
3	Booklets, brochures, leaflets, etc., from clinic or health professionals	16(27.6)	15(25.9)	11(19.0)	16(27.6)	58	2.53	1.17
4	Magazines/newspaper/news magazine	15(25.9)	13(22.4)	13(22.4)	17(29.3)	58	2.24	1.17
5	Internet	26(44.8)	11(19.0)	9(15.5)	12(20.7)	58	2.88	1.20
6	WhatsApp groups	18(31.0)	19(32.8)	15(25.9)	6(10.3)	58	2.84	0.98
7	Facebook pages/Facebook groups	25(43.1)	10(17.2)	17(29.3)	6(10.3)	58	2.93	1.07
8	Blogs	14(24.1)	21(36.2)	18(31.0)	5(8.6)	58	2.76	0.92
9	Twitter	8(13.8)	11(19.0)	12(20.7)	27(46.6)	58	2.00	1.11
10	Instagram	19(32.8)	9(15.5)	12(20.7)	18(31.0)	58	2.50	1.25
11	Health professionals	21(36.2)	9(15.5)	20(34.5)	8(13.8)	58	2.74	1.10
12	Broadcast media (television, radio)	14(24.1)	17(29.3)	13(22.4)	14(24.1)	58	2.53	1.11
13	Diabetic Patients' Associations	16(27.6)	11(19.0)	6(10.3)	25(43.1)	58	2.31	1.29
14	Family and friends	18(31.0)	15(25.9)	17(29.3)	8(13.8)	58	2.74	1.05
15	Seminars for diabetics	18(31.0)	15(25.9)	10(17.2)	15(25.9)	58	2.62	1.18
16	Other patients with diabetes	18(31.0)	17(29.3)	12(20.7)	11(19.0)	58	2.72	1.11

Research Question 7: What is the effect of health information seeking behaviour on the mental health of diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

Federal Medical Centre Bida

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Does your information-seeking behaviour make you anxious?	2(5.3)	9(23.7)	9(23.7)	18(47.4)	38	1.87	9.63
2	Does your information-seeking behaviour make you depressed?	14(36.8)	3(7.9)	8(21.1)	13(34.2)	38	2.47	1.31
3	Does your information-seeking behaviour affect your personality?	9(23.7)	11(28.9)	3(7.9)	15(39.5)	38	2.37	1.24
4	Does your information-seeking behaviour cause you delusion?	3(7.9)	6(15.8)	9(23.7)	20(52.6)	38	1.79	0.99
5	Does your information-seeking behaviour make you think negatively?	14(36.8)	9(23.7)	7(18.4)	8(21.1)	38	2.76	1.17
6	Does your information-seeking behaviour make you hallucinate?	6(15.8)	8(21.1)	6(15.8)	18(47.4)	38	2.05	1.16
7	Does your information-seeking behaviour give you mood swings?	14(36.8)	5(13.2)	14(36.8)	5(13.2)	38	2,74	1.1
8	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?	5(13.2)	9(23.7)	6(15.8)	18(47.4)	38	2.03	1.12
9	Does your information-seeking behaviour make you lose interest in activities?	15(39.5)	12(31.6)	8(21.1)	3(7.9)	38	3.03	0.97

Federal Medical Centre Makurdi, Benue State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Does your information-seeking behaviour make you anxious?	15(35.7)	9(21.4)	8(19.0)	10(23.8)	42	2.69	1.20
2	Does your information-seeking behaviour make	15(35.7)	3(7.1)	15(35.7)	9(21.4)	42	2.57	1.19

	you depressed?							
3	Does your information-seeking behaviour affect your personality?	7(16.7)	9(21.4)	7(16.7)	19(45.2)	42	2.10	1.16
4	Does your information-seeking behaviour cause you delusion?	7(16.7)	7(16.7)	9(21.4)	19(45.2)	42	2.05	1.15
5	Does your information-seeking behaviour make you think negatively?	16(38.1)	11(26.2)	10(23.8)	5(11.9)	42	2.90	1.01
6	Does your information-seeking behaviour make you hallucinate?	5(11.9)	7(16.7)	6(14.3)	24(57.1)	42	1.83	1.10
7	Does your information-seeking behaviour give you mood swings?	16(38.1)	4(9.5)	11(26.2)	11(26.2)	42	2.60	1.25
8	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?	5(11.9)	6(14.3)	9(21.4)	22(52.4)	42	1.86	1.07
9	Does your information-seeking behaviour make you lose interest in activities?	17(40.5)	13(31.0)	5(11.9)	7(16.7)	42	2.95	1.10

Federal Medical Centre Keffi, Nasarawa State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Does your information-seeking behaviour make you anxious?	5(14.3)	6(17.1)	8(22.9)	16(45.7)	35	2.00	1.11
2	Does your information-seeking behaviour make you depressed?	13(37.1)	2(5.7)	10(28.6)	10(28.6)	35	2.51	1.27
3	Does your information-seeking behaviour affect your personality?	4(11.4)	6(17.1)	6(17.1)	19(54.3)	35	1.86	1.09
4	Does your information-seeking behaviour cause you delusion?	3(8.6)	7(20.0)	6(17.1)	19(54.3)	35	1.83	1.04
5	Does your information-seeking behaviour make you think negatively?	12(34.3)	9(25.7)	9(25.7)	5(14.3)	35	2.80	1.07
6	Does your information-seeking behaviour make you hallucinate?	15(42.9)	5(14.3)	7(20.0)	8(22.9)	35	2.77	1.24

7	Does your information-seeking behaviour give you mood swings?	13(37.1)	8(22.9)	7(20.0)	7(20.0)	35	2.77	1.69
8	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?	4(11.4)	4(11.4)	8(22.9)	19(54.3)	35	1.80	1.05
9	Does your information-seeking behaviour make you lose interest in activities?	12(34.3)	8(22.9)	7(20.0)	8(22.9)	35	2.69	1.18

Federal Medical Centre Lokoja

S/No	**Statement**	**SA 4**	**A 3**	**D 2**	**SD 1**	**n**	$\bar{X}$	**StD**
1	Does your information-seeking behaviour make you anxious?	8(17.8)	7(15.6)	12(26.7)	18(40.0)	45	2.11	1.13
2	Does your information-seeking behaviour make you depressed?	14(31.1)	7(15.6)	15(33.3)	9(20.0)	45	2.58	1.14
3	Does your information-seeking behaviour affect your personality?	6(13.3)	8(17.8)	7(15.6)	24(53.3)	45	1.91	1.13
4	Does your information-seeking behaviour cause you delusion?	6(13.3)	7(15.6)	12(26.7)	20(44.4)	45	1.98	1.07
5	Does your information-seeking behaviour make you think negatively?	11(24.4)	6(13.3)	13(28.9)	15(33.3)	45	2.29	1.18
6	Does your information-seeking behaviour make you hallucinate?	6(13.3)	6(13.3)	10(22.2)	23(51.1)	45	1.89	1.09
7	Does your information-seeking behaviour give you mood swings?	14(31.1)	2(4.4)	7(15.6)	22(48.9)	45	2.18	1.34
8	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?	8(17.8)	6(13.3)	12(26.7)	19(42.2)	45	2.07	1.14
9	Does your information-seeking behaviour make you lose interest in activities?	17(37.8)	13(28.9)	9(20.0)	6(13.3)	45	2.91	1.06

Jos University Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Does your information-seeking behaviour make you anxious?	8(14.8)	14(25.9)	13(24.1)	19(35.2)	54	2.20	1.08
2	Does your information-seeking behaviour make you depressed?	17(31.5)	10(18.5)	10(18.5)	17(31.5)	54	2.50	1.24
3	Does your information-seeking behaviour affect your personality?	12(22.2)	12(22.2)	11(20.4)	19(35.2)	54	2.31	1.18
4	Does your information-seeking behaviour cause you delusion?	5(9.3)	8(14.8)	14(25.9)	27(50.0)	54	1.83	1.00
5	Does your information-seeking behaviour make you think negatively?	19(35.2)	13(24.1)	9(16.7)	13(24.1)	54	2.70	1.19
6	Does your information-seeking behaviour make you hallucinate?	7(13.0)	9(16.7)	9(16.7)	29(53.7)	54	1.89	1.11
7	Does your information-seeking behaviour give you mood swings?	17(31.5)	8(14.8)	24(44.4)	5(9.3)	54	2.69	1.02
8	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?	6(11.1)	11(20.4)	8(14.8)	29(53.7)	54	1.89	1.09
9	Does your information-seeking behaviour make you lose interest in activities?	19(35.2)	21(38.9)	9(16.7)	5(9.3)	54	3.00	0.95

University of Abuja Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Does your information-seeking behaviour make you anxious?	10(16.4)	15(24.6)	13(21.3)	23(37.7)	61	2.20	1.12
2	Does your information-seeking behaviour make you depressed?	22(36.1)	10(16.4)	12(19.7)	17(27.9)	61	2.61	1.24
3	Does your information-seeking behaviour affect your personality?	22(36.1)	10(16.4)	16(26.2)	13(21.3)	61	2.67	1.18
4	Does your information-seeking behaviour cause you delusion?	6(9.8)	9(14.8)	14(23.0)	32(52.5)	61	1.82	1.03

5	Does your information-seeking behaviour make you think negatively?	22(36.1)	15(24.6)	9(14.8)	15(24.6)	61	2.72	1.19
6	Does your information-seeking behaviour make you hallucinate?	8(13.1)	9(14.8)	9(14.8)	35(57.4)	61	1.84	1.11
7	Does your information-seeking behaviour give you mood swings?	19(31.1)	9(14.8)	28(45.9)	5(8.2)	61	2.69	1.00
8	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?	7(11.5)	13(19.7)	8(13.1)	34(55.7)	61	1.87	1.10
9	Does your information-seeking behaviour make you lose interest in activities?	18(29.5)	25(41.0)	14(23.0)	4(6.6)	61	2.93	0.89

University of Ilorin Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Does your information-seeking behaviour make you anxious?	27(46.6)	11(19.0)	11(19.0)	9(15.5)	58	2.97	1.14
2	Does your information-seeking behaviour make you depressed?	20(34.5)	12(20.7)	9(15.5)	17(29.3)	58	2.60	1.24
3	Does your information-seeking behaviour affect your personality?	22(37.9)	10(17.2)	13(22.4)	13(22.4)	58	2.71	1.20
4	Does your information-seeking behaviour cause you delusion?	9(15.5)	7(12.1)	18(31.0)	24(41.4)	58	2.02	1.08
5	Does your information-seeking behaviour make you think negatively?	20(34.5)	18(31.0)	8(13.8)	12(20.70	58	2.79	1.14
6	Does your information-seeking behaviour make you hallucinate?	17(29.3)	8(13.8)	14(24.1)	19(32.8)	58	2.40	1.22
7	Does your information-seeking behaviour give you mood swings?	21(36.2)	7(12.1)	22(37.9)	8(13.8)	58	2.71	1.11
8	Does your information-seeking behaviour give you Obsessive-Compulsive Disorder (OCD)?	7(12.1)	11(19.0)	13(22.4)	27(46.6)	58	1.97	1.08
9	Does your information-seeking behaviour make you lose interest in activities?	15(25.9)	23(39.7)	12(20.7)	8(13.8)	58	2.78	0.99

Research Question 8: What is the impact of health information–seeking behaviour on the management of diabetes mellitus by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

Federal Medical Centre Bida, Niger State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My health information-seeking behaviour has reduced the money I spend on drugs	4(10.5)	6(15.8)	13(34.2)	15(39.5)	38	1.97	1.00
2	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in	8(21.1)	14(36.8)	12(31.6)	4(10.5)	38	2.68	0.93
3	My health information-seeking behaviour reduced my visit to the healthcare centre	16(42.1)	6(15.8)	8(21.1)	8(21.1)	38	2.79	1.21
4	My health information-seeking behaviour has helped me to know the proper diet to take	13(34.2)	10(26.3)	3(7.9)	12(31.6)	38	2.63	1.26
5	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus	12(31.6)	10(26.3)	11(28.9)	5(13.2)	38	2.76	1.05
6	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible	12(31.6)	8(21.1)	11(28.9)	7(18.4)	38	2.66	1.12
7	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)	14(36.8)	6(15.8)	11(28.9)	7(18.4)	38	2.71	1.16
8	My health information-seeking behaviour helps me to give first aid attention if there is a crisis	12(31.6)	15(39.5)	5(13.2)	6(15.8)	38	2.87	1.04

Federal Medical Centre Makurdi

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My health information-seeking behaviour has reduced the money I spend on drugs	14(33.3)	7(16.7)	12(28.6)	9(21.4)	42	2.62	1.17
2	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in	11(26.2)	10(23.8)	10(23.8)	11(26.2)	42	2.50	1.15

3	My health information-seeking behaviour reduced my visit to the healthcare centre	10(23.8)	6(14.3)	8(19.0)	18(42.9)	42	2.19	1.23
4	My health information-seeking behaviour has helped me to know the proper diet to take	17(40.5)	6(14.3)	5(11.9)	14(33.3)	42	2.62	1.32
5	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus	10(23.8)	10(23.8)	11(26.2)	11(26.2)	42	2.45	1.13
6	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible	17(40.5)	7(16.7)	14(33.3)	4(9.5)	42	2.88	1.06
7	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)	15(35.7)	7(16.7)	12(28.6)	8(19.0)	42	2.69	1.16
8	My health information-seeking behaviour helps me to give first aid attention if there is a crisis	9(21.4)	15(35.7)	12(28.6)	6(14.3)	42	2.64	0.98

Federal Medical Centre Keffi

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My health information-seeking behaviour has reduced the money I spend on drugs	11(31.4)	9(25.7)	9(25.7)	6(17.1)	35	2.71	1.10
2	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in	13(37.1)	6(17.1)	8(22.9)	8(22.9)	35	2.69	1.21
3	My health information-seeking behaviour reduced my visit to the healthcare centre	9(25.7)	4(11.4)	8(22.9)	14(40.0)	35	2.23	1.24
4	My health information-seeking behaviour has helped me to know the	14(40.0)	7(20.0)	5(14.3)	9(25.7)	35	2.74	1.25

	proper diet to take							
5	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus	4(11.4)	5(14.3)	8(22.9)	18(51.4)	35	1.86	1.06
6	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible	11(31.4)	13(37.1)	7(20.0)	4(11.4)	35	2.89	0.99
7	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)	9(25.7)	14(40.0)	7(20.0)	5(14.3)	35	2.77	1.00
8	My health information-seeking behaviour helps me to give first aid attention if there is a crisis	11(31.4)	10(28.6)	10(28.6)	4(11.4)	35	2.80	1.03

Federal Medical Centre Lokoja, Kogi State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My health information-seeking behaviour has reduced the money I spend on drugs	21(46.7)	7(15.6)	9(20.0)	8(17.8)	45	2.91	1.18
2	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in	13(28.9)	11(24.4)	10(22.2)	11(24.4)	45	2.58	1.16
3	My health information-seeking behaviour reduced my visit to the healthcare centre	9(20.0)	5(11.1)	12(26.7)	19(42.2)	45	2.09	1.16
4	My health information-seeking behaviour has helped me to know the proper diet to take	22(48.9)	9(20.0)	3(6.7)	11(24.4)	45	2.93	1.25
5	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus	6(13.3)	10(22.2)	11(24.4)	18(40.0)	45	2.09	1.08

6	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible	15(33.3)	10(22.2)	13(28.9)	7(15.6)	45	2.73	1.09
7	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)	14(31.1)	4(8.9)	14(31.1)	13(28.9)	45	2.42	1.21
8	My health information-seeking behaviour helps me to give first aid attention if there is a crisis	11(24.4)	13(28.9)	15(33.3)	6(13.3)	45	2.64	1.00

Jos University Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My health information-seeking behaviour has reduced the money I spend on drugs	18(33.3)	10(18.5)	11(20.4)	15(27.8)	54	2.57	1.22
2	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in	4(7.4)	20(37.0)	15(27.8)	15(27.8)	54	2.24	0.95
3	My health information-seeking behaviour reduced my visit to the healthcare centre	18(33.3)	7(13.0)	9(16.7)	20(37.0)	54	2.43	1.29
4	My health information-seeking behaviour has helped me to know the proper diet to take	22(40.7)	10(18.5)	5(9.3)	17(31.5)	54	2.69	1.30
5	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus	13(24.1)	10(18.5)	11(20.4)	20(37.0)	54	2.30	1.20
6	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible	13(24.1)	12(22.2)	22(40.7)	7(13.0)	54	2.57	1.00
7	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)	25(46.3)	6(11.1)	16(29.6)	7(13.0)	54	2.91	1.14

8	My health information-seeking behaviour helps me to give first aid attention if there is a crisis	16(29.6)	23(42.6)	5(9.3)	10(18.5)	54	2.83	1.06

University of Abuja Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My health information-seeking behaviour has reduced the money I spend on drugs	18(29.5)	14(23.0)	14(23.0)	15(24.6)	61	2.57	1.16
2	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in	12(19.7)	21(34.4)	15(24.6)	13(21.3)	61	2.52	1.04
3	My health information-seeking behaviour reduced my visit to the healthcare centre	16(26.2)	8(13.1)	16(26.2)	21(34.4)	61	2.31	1.21
4	My health information-seeking behaviour has helped me to know the proper diet to take	27(44.3)	10(16.4)	9(14.8)	15(24.6)	61	2.80	1.25
5	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus	14(23.0)	14(23.0)	10(16.4)	23(37.7)	61	2.31	1.21
6	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible	18(29.5)	12(19.7)	18(29.5)	13(21.3)	61	2.57	1.13
7	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)	24(39.3)	8(13.1)	17(27.9)	12(19.7)	61	2.72	1.10
8	My health information-seeking behaviour helps me to give first aid attention if there is a crisis	17(27.9)	24(39.3)	5(8.2)	15(24.6)	61	2.70	1.13

University of Ilorin Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My health information-seeking behaviour has reduced the money I spend on drugs	16(27.6)	19(32.8)	11(19.0)	12(20.7	58	2.67	1.20
2	My health information-seeking behaviour has helped me to know the right exercise that I can indulge in	19(32.8)	18(31.0)	13(22.4)	8(13.8)	58	2.83	1.05
3	My health information-seeking behaviour reduced my visit to the healthcare centre	16(27.6)	8(13.8)	16(27.6)	18(31.0)	58	2.38	1.20
4	My health information-seeking behaviour has helped me to know the proper diet to take	19(32.8)	12(20.7)	13(22.4)	14(24.1)	58	2.62	1.18
5	My health information-seeking behaviour makes me know the new medication and treatments available for diabetes mellitus	19(32.8)	11(19.0)	13(22.4)	15(25.9)	58	2.59	1.20
6	My health information-seeking behaviour helps me to keep my blood glucose level as near to normal as possible	24(41.4)	8(13.8)	13(22.4)	13(22.4)	58	2.74	1.22
7	My health information-seeking behaviour has made me know that there are habits that I must quit (e.g. smoking and drinking)	17(29.3)	15(25.9)	16(27.6)	10(17.2)	58	2.67	1.08
8	My health information-seeking behaviour helps me to give first aid attention if there is a crisis	16(27.6)	22(37.9)	10(17.2)	10(17.2)	58	2.76	1.05

Research Question 9: What are the socio-economic determinants of health information seeking behaviour among patients in tertiary healthcare facilities in North Central, Nigeria?**Federal Medical Centre Bida**

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My age affects my health information-seeking	5(13.2)	5(13.2)	9(23.7)	19(50.0)		1.87	1.08

	behaviour							
2	My educational status affects my health information-seeking behaviour	12(31.6)	8(21.1)	7(18.4)	11(28.9)		2.55	1.22
3	My employment status affects my health information-seeking behaviour	6(15.8)	6(15.8)	7(18.4)	19(50.0)		1.97	1.50
4	My wealth quintile affects my health information-seeking behaviour	14(36.8)	11(28.9)	5(13.2)	8(21.1)		2.8	1.16
5	My marital status affects my health information-seeking behaviour	3(7.9)	6(15.8)	7(18.4)	22(57.9)		1.74	1.00
6	My geographical location affects my health information-seeking behaviour	14(36.8)	9(23.7)	6(15.8)	9(23.7)		2.74	1.20
7	My religion affects my health information-seeking behaviour	9(23.7)	4(10.5)	8(21.1)	17(44.7)		2.13	1.23

Federal Medical Centre Makurdi

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My age affects my health information-seeking behaviour	4(9.5)	5(11.9)	19(45.2)	14(33.3)	42	1.98	0.92
2	My educational status affects my health information-seeking behaviour	18(42.6)	10(23.8)	3(7.1)	11(26.2)	42	2.83	1.25
3	My employment status affects my health information-seeking behaviour	12(28.6)	13(31.0)	4(9.5)	13(31.0)	42	2.57	1.21
4	My wealth quintile affects my health information-seeking behaviour	12(28.6)	13(31.0)	11(26.2)	6(14.3)	42	2.74	1.04
5	My marital status affects my health information-seeking behaviour	2(4.8)	8(19.0)	7(16.7)	25(59.5)	42	1.69	0..95
6	My geographical location affects my health information-seeking behaviour	10(23.8)	4(9.5)	13(31.0)	15(35.7)	42	2.21	1.18
7	My religion affects my health information-seeking behaviour	7(16.7)	2(4.8)	11(26.2)	22(52.4)	42	1.86	1.11

Federal Medical Centre Keffi

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My age affects my health information-seeking behaviour	4(11.4)	1(2.9)	15(42.9)	15(42.9)	35	1.83	0.94
2	My educational status affects my health information-seeking behaviour	11(31.4)	6(17.1)	4(11.4)	14(40.0)	35	2.40	1.31
3	My employment status affects my health information-seeking behaviour	9(25.7)	9(25.7)		17(48.6)	35	2.29	1.32
4	My wealth quintile affects my health information-seeking behaviour	12(34.3)	7(20.0)	14(40.0)	2(5.7)	35	2.8	0.99
5	My marital status affects my health information-seeking behaviour	5(14.3)	7(20.0)	6(17.1)	17(48.6)	35	2.00	1.14
6	My geographical location affects my health information-seeking behaviour	8(22.9)	1(2.9)	13(37.1)	13(37.1)	35	2.11	1.16
7	My religion affects my health information-seeking behaviour	4(11.4)	2(5.7)	11(31.4)	18(51.4)	35	1.77	1.00

Federal Medical Centre Lokoja

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My age affects my health information-seeking behaviour	7(15.6)	10(22.2)	16(35.6)	12(26.7)	45	2.27	1.03
2	My educational status affects my health information-seeking behaviour	18(40.0)	10(22.2)	3(6.7)	14(31.1)	45	2.71	1.29
3	My employment status affects my health information-seeking behaviour	9(20.0)	11(24.4)	8(17.8)	17(37.8)	45	2.27	1.18
4	My wealth quintile affects my health information-seeking behaviour	12(26.7)	14(31.1)	14(31.1)	5(11.1)	45	2.73	0.98
5	My marital status affects my health information-seeking behaviour	5(11.1)	5(11.1)	11(24.4)	24(53.3)	45	1.80	1.04
6	My geographical location affects my health information-seeking behaviour	23(53.3)	6(13.3)	13(28.9)	3(6.7)	45	3.09	1.04

7	My religion affects my health information-seeking behaviour	7(15.6)	7(15.6)	11(24.4)	20(44.4)	45	2.02	1.11

Jos University Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	N	$\bar{X}$	StD
1	My age affects my health information-seeking behaviour	5(9.3)	5(9.3)	20(37.0)	24(44.4)	54	54	1.83
2	My educational status affects my health information-seeking behaviour	18(33.3)	12(22.2)	7(13.0)	17(31.5)	54	2.57	1.25
3	My employment status affects my health information-seeking behaviour	8(14.8)	5(9.3)	14(25.9)	27(50.0)	54	1.89	1.09
4	My wealth quintile affects my health information-seeking behaviour	14(25.9)	19(35.2)	8(14.8)	13(24.1)	54	2.63	1.12
5	My marital status affects my health information-seeking behaviour	5(9.3)	6(11.1)	17(31.5)	26(48.1)	54	1.81	0.97
6	My geographical location affects my health information-seeking behaviour	20(37.0)	10(18.5)	16(29.6)	8(14.8)	54	2.78	1.11
7	My religion affects my health information-seeking behaviour	7(13.0)	4(7.4)	15(27.8)	28(51.9)	54	1.81	1.04

University of Abuja Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My age affects my health information-seeking behaviour	3(4.9)	5(8.2)	30(49.2)	23(37.7)	61	1.80	0.79
2	My educational status affects my health information-seeking behaviour	18(29.5)	14(23.0)	11(18.0)	18(29.5)	61	2.52	1.21
3	My employment status affects my health information-seeking behaviour	10(16.4)	7(11.5)	20(32.8)	24(39.3)	61	2.05	1.09
4	My wealth quintile affects my health information-seeking behaviour	14(23.0)	23(37.7)	9(14.8)	15(24.6)	61	2.59	1.10
5	My marital status affects my health information-seeking	12(19.7)	5(8.2)	16(26.2)	28(45.9)	61	2.02	1.16

	behaviour							
6	My geographical location affects my health information-seeking behaviour	14(23.0)	9(14.8)	17(27.9)	21(34.4)	61	2.26	1.17
7	My religion affects my health information-seeking behaviour	7(11.5)	5(8.2)	14(24.0)	35(57.4)	61	1.74	1.03

University of Ilorin Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	My age affects my health information-seeking behaviour	7(12.1)	4(6.9)	28(48.3)	19(32.8)	58	1.98	0.95
2	My educational status affects my health information-seeking behaviour	17(29.3)	13(22.4)	12(20.7)	16927.6)	58	2.53	1.19
3	My employment status affects my health information-seeking behaviour	8(13.8)	8(13.8)	21(36.2)	21(36.2)	58	2.05	1.03
4	My wealth quintile affects my health information-seeking behaviour	18(31.0)	17(29.30	10(17.2)	13(22.4)	58	2.69	1.14
5	My marital status affects my health information-seeking behaviour	12(20.7)	6(10.3)	20(34.5)	20(34.5)	58	2.17	1.13
6	My geographical location affects my health information-seeking behaviour	20(34.5)	7(12.1)	17(29.3)	14(24.1)	58	2.57	1.20
7	My religion affects my health information-seeking behaviour	9(15.5)	8(13.8)	21(36.2)	20(34.5)	58	2.10	1.05

Research Question 10: What are the challenges encountered in using health information by diabetic patients in tertiary healthcare facilities in North Central, Nigeria?

Federal Medical Centre Bida

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Lack of time	8(21.1)	4(10.5)	12(31.6)	14(36.8)	38	2.16	1.15

2	High cost of data subscription	13(34.2)	4(10.5)	10(26.3)	11(28.9)	38	2.50	1.25
3	Poor Internet connectivity	6(15.8)	4(10.5)	19(50.0)	9(23.7)	38	2.18	0.98
4	Data smog (Information overload)	8(21.1)	1(2.6)	7(18.4)	22(57.9)	38	1.87	1.21
5	Lack of adequate diabetic programs on radio and television stations	13(34.2)	4(10.5)	11(28.9)	10(26.3)	38	2.53	1.22
6	Lack of adequate hard copy materials	13(34.2)	3(7.9)	10(26.3)	12(31.6)	38	2.45	1.27
7	Lack of computer literacy	13(34.2)	4(10.5)	12(31.6)	9(23.7)	38	2.55	1.20
8	Psychological issues	13(34.2)	9(23.7)	8(21.1)	8(21.1)	38	2.71	1.60
9	Lack of understanding information due to scientific and medical terms used	17(44.7)	8(21.1)	2(5.3)	11(28.9)	38	2.82	1.29
10	Problems in the doctor-patient relationship	9(23.7)	4(10.5)	8(21.1)	17(44.7)	38	2.13	1.23

Federal Medical Centre Makurdi

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Lack of time	10(23.8)	4(9.5)	13(31.0)	15(35.7)	42	2.21	1.18
2	High cost of data subscription	17(40.5)	9(21.4)	11(26.2)	5(11.9)	42	2.90	1.07
3	Poor Internet connectivity	2(4.8)	1(2.4)	23(54.8)	16(38.1)	42	1.74	0.73
4	Data smog (Information overload)	15(35.7)	8(19.0)	9(21.4)	10(23.8)	42	2.67	1.20
5	Lack of adequate diabetic programs on radio and television stations	17(40.5)	6(14.3)	9(21.4)	10(23.8)	42	2.71	1.24
6	Lack of adequate hard copy materials	13(31.0)	11(26.2)	5(11.9)	13(31.0)	42	2.57	1.23
7	Lack of computer literacy	5(11.9)	4(9.5)	13(31.0)	20(47.6)	42	1.86	1.02
8	Psychological issues	9(21.4)	11(26.2)	8(19.0)	14(33.3)	42	2.36	1.16
9	Lack of understanding information due to scientific and medical terms used	14(33.3)	8(19.0)	2(4.8)	18(42.9)	42	2.43	1.34
10	Problems in the doctor-patient relationship	7(16.7)	4(9.5)	16(38.1)	15(35.7)	42	2.07	1.07

Federal Medical Centre Keffi

Federal Medical Centre Keffi, Nasarawa State

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Lack of time	9(25.7)	4(11.4)	11(31.4)	11(31.4)	35	1.18	1.32
2	High cost of data subscription	13(37.1)	9(25.7)	6(17.1)	7(20.0)	35	2.80	1.16
3	Poor Internet connectivity	4(11.4)	4(11.4)	15(42.9)	12(34.3)	35	2.00	0.97
4	Data smog (Information overload)	11(31.4)	11(31.4)	7(20.0)	6(17.1)	35	2.77	1.09
5	Lack of adequate diabetic programs on radio and television stations	7(20.0)	4(11.4)	11(31.4)	13(37.1)	35	2.14	1.14
6	Lack of adequate hard copy materials	12(34.3)	10(28.6)	5(14.3)	8(22.9)	35	2.74	1.17
7	Lack of computer literacy	11(31.4)	4(11.4)	9(25.7)	4(11.4)	35	2.43	1.17
8	Psychological issues	5(14.3)	7(20.0)	6(17.1)	17(48.6)	35	2.00	1.14
9	Lack of understanding information due to scientific and medical terms used	14(40.0)	8(22.9)	2(5.7)	11(31.4)	35	2.71	1.29
10	Problems in the doctor-patient relationship	7(20.0)	4(11.4)	9(25.7)	15(42.9)	35	2.09	1.17

Federal Medical Centre Lokoja

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Lack of time	11(24.4)	4(8.9)	17(38.9)	13(28.9)	45	2.29	1.14
2	High cost of data subscription	17(37.8)	9(20.0)	14(31.1)	5(11.1)	45	2.84	1.06
3	Poor Internet connectivity	17(37.8)	6(13.3)	17(37.8)	5(11.1)	45	2.78	1.08
4	Data smog (Information overload)	15(33.3)	8(17.8)	12(26.7)	10(22.2)	45	2.62	1.17
5	Lack of adequate diabetic programs on radio and television stations	13(28.9)	7(15.6)	17(37.8)	8(17.8)	45	2.56	1.09
6	Lack of adequate hard copy materials	13(28.9)	11(24.4)	10(22.2)	11(24.4)	45	2.58	1.16
7	Lack of computer literacy	9(20.0)	3(6.7)	18(40.0)	5(11.1)	45	2.13	1.10
8	Psychological issues	8(17.8)	9(20.0)	17(37.8)	21(46.7)	45	2.09	1.84

9	Lack of understanding information due to scientific and medical terms used	15(33.3)	11(24.4)	7(15.6)	12(26.7)	45	2.64	1.21
10	Problems in the doctor-patient relationship	7(15.6)	4(8.9)	18(40.0)	16(35.6)	45	2.04	1.04

Jos University Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Lack of time	11(20.4)	4(7.4)	15(27.8)	24(44.4)	54	2.04	1.16
2	High cost of data subscription	9(16.7)	2(3.7)	19(35.2)	24(44.4)	54	1.93	1.08
3	Poor Internet connectivity	20(37.0)	4(7.4)	19(35.2)	11(20.4)	54	2.62	1.18
4	Data smog (Information overload)	22(40.7)	1(1.9)	13(24.1)	18(33.3)	54	2.50	1.32
5	Lack of adequate diabetic programs on radio and television stations	20(37.0)	4(7.4)	18(33.3)	12(22.2)	54	2.59	1.20
6	Lack of adequate hard copy materials	24(44.4)	5(9.3)	15(27.8)	10(18.5)	54	2.80	1.20
7	Lack of computer literacy	5(9.3)	3(5.6)	24(44.4)	22(40.7)	54	1.83	0.90
8	Psychological issues	16(29.6)	14(25.9)	17(31.5)	7(13.0)	54	2.72	1.03
9	Lack of understanding information due to scientific and medical terms used	20(37.0)	8(14.8)	5(9.3)	21(38.9)	54	2.50	1.34
10	Problems in the doctor-patient relationship	9(16.7)	4(7.4)	11(20.4)	30(55.6)	54	1.85	1.14

University of Abuja Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Lack of time	11(18.0)	9(14.8)	16(26.2)	25(41.0)	61	2.10	1.14
2	High cost of data subscription	9(14.8)	5(8.2)	24(39.3)	23(37.7)	61	2.00	1.03
3	Poor Internet connectivity	20(32.8)	6(9.8)	21(34.4)	14(23.0)	61	2.52	1.18
4	Data smog (Information overload)	28(45.9)	4(6.6)	14(23.0)	15(24.6)	61	2.74	1.28
5	Lack of adequate diabetic programs on radio and television stations	23(37.7)	8(13.1)	19(31.1)	11(18.0)	61	2.70	1.16

6	Lack of adequate hard copy materials	26(42.6)	10(16.4)	15(24.6)	10(16.4)	61	2.85	1.15
7	Lack of computer literacy	8(13.1)	8(13.1)	26(42.6)	19(31.1)	61	2.08	0.98
8	Psychological issues	16(26.2)	13(21.3)	18(29.5)	14(23.0)	61	2.51	1.12
9	Lack of understanding information due to scientific and medical terms used	23(37.7)	10(16.4)	7(11.5)	21(34.4)	61	2.57	1.31
10	Problems in the doctor-patient relationship	9(14.8)	11(18.0)	17(27.9)	24(39.3)	61	2.08	1.08

University of Ilorin Teaching Hospital

S/No	Statement	SA 4	A 3	D 2	SD 1	n	$\bar{X}$	StD
1	Lack of time	10(17.2)	7(12.1)	23(39.7)	18(31.0)	58	2.16	1.06
2	High cost of data subscription	20(34.5)	13(22.4)	12(20.7)	13(22.4)	58	2.69	1.17
3	Poor Internet connectivity	18(31.0)	8(13.8)	20(34.5)	12(20.7)	58	2.55	1.14
4	Data smog (Information overload)	22(37.9)	11(19.0)	14(24.1)	11(19.0)	58	2.76	1.16
5	Lack of adequate diabetic programs on radio and television stations	12(20.7)	7(12.1)	21(36.2)	18(31.0)	58	2.22	1.11
6	Lack of adequate hard copy materials	24(41.4)	10(17.2)	18(31.0)	6(10.3)	58	2.90	1.07
7	Lack of computer literacy	10(17.2)	8(13.8)	23(39.7)	17(29.3)	58	2.19	1.05
8	Psychological issues	15(25.9)	20(34.5)	17(29.3)	6(10.3)	58	2.76	0.96
9	Lack of understanding information due to scientific and medical terms used	15(25.9)	13(22.4)	12(20.7)	18(31.0)	58	2.43	1.19
10	Problems in the doctor-patient relationship	11(19.0)	15(25.9)	17(29.3)	15(25.9)	58	2.38	1.07