INFORMATION NEEDS AND INFORMATION SEEKING BEHAVIOUR OF NURSING AND CLINICAL STUDENTS IN MEDICAL LIBRARIES: A CASE STUDY OF AGA KHAN UNIVERSITY

CATHERINE WANYINGI

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DECLARATION

This research project is my original work and has not been submitted for examination to any other university.

Signature: _____ Date: _____

Catherine Wanyingi

Registration Number: C54/81402/2015

This research project has been submitted for examination with our approval as the university supervisors.

Signature:_____ Date: _____

Dr. G.M. Kingori

Department of Library and Information Science

Signature:_____ Date: _____

Dr. Grace Irura

Department of Library and Information Science

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ABSTRACT

Information seeking behavior is pertinent to effective retrieval of information by a scholar. Without a better understanding of the strategies used by information seekers, a library may not effectively meet the needs of its users. This study sought to determine the information needs and information seeking behavior of nursing and clinical students at Aga Khan University (AKU). The specific objectives were: to establish the information sources used by nursing and clinical students at AKU library; to determine how nursing and clinical students obtain and access the required information for their medical practice decision-making; to analyse whether the existing information sources in the library meet the needs of nursing and clinical students at AKU; and lastly to examine the challenges that nursing and clinical students experience in accessing and acquiring information at AKU library. The study was anchored on Wilson's Information Behavior Model (1999). The study adopted a mixed methods research design. The target population comprised of 88 clinical and nursing students and 12 library staff at the University. The study used Krejcie and Morgan (1970) formula to determine the sample size. The sample size was 70 nursing and clinical students and 10 library staff who were selected using random sampling. The study collected primary data through use of a questionnaire and an interview guide. The questionnaire was administered to the clinical and nursing students in AKU through drop and pick method while the interview guide helped to get in-depth information from the library staff. The quantitative data was analyzed through descriptive statistics which included means, standard deviation, frequency and percentage distribution. The analysis was conducted through the SPSS software Version 20. The qualitative data was analyzed through content analysis and reported in narrative form along with quantitative data. The quantitative data was presented using pie charts, bar charts, percentages and frequency tables. The study found out that majority of the respondents (82.3%) indicated that the students searched for online resources in the library, 77.4% indicated that they searched for journals while 67.7% searched for text books. The study found out that the students used varied strategies such as keyword search, title search, author search, subject search to access information in the library. The students were seeking information in the library for the purpose of preparing materials to enable them write reports or research papers (77.4%), to help them in their class work (82.3%), and to improve their knowledge in their area of practice (67.7%). The study concludes that nursing and clinical students in AKU made use of all available resources. The students were satisfied with the information sources in the AKU library since it met their information needs. The students acknowledged that there were various challenges which include inadequate computers for students use, slow internet in the library and lack of knowledge on search engines and information materials by some library staff. The study recommends that the university needs to employ more trained and experienced library staff to be able to support the users. There should also be greater collaboration between students and librarians so as to ensure the students are able to effectively search for materials they need in the library. The study will be of significance to AKU library staff, the students using the library, to researchers and library adminstrators.

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LIST OF ABBREVIATIONS AND ACRONYMS

AKHS   Aga Khan Health Services

AKU   Aga Khan University

CINAHL   Cumulative Index to Nursing and Allied Health Literature

ICT   Information and communication technology

MEDLINE   Medical Literature Analysis and Retrieval System Online, or

MEDLARS Online

SPSS   Statistical Package for Social Sciences

WHO   World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The role of information has been acknowledged as an important aspect in the research activities of the graduates (Franklin, 2005). It is believed that a better understanding of the information needs and the information seeking behaviors of graduates is fundamental to the achievement of the graduates' research activities (Thani & Hashim, 2011). With the proliferation of information sources, information seeking behaviors of users of libraries have evolved in the past 20 years. Rutland and Smith (2010) describe information seeking behavior as the way in which people "search for and utilize information." It is also described as the totality of human behavior in line with the sources of information and channels through which such information is obtained and utilized. It also encompasses the passive and active information seeking and use (Al-Suqri, 2015).

Information seeking could be said to be a purposive seeking of information that aims at satisfying a particular goal. Thus, the element of "purposiveness" is key to the understanding the information seeking behavior at a micro-level by the searcher and how the searcher interacts with various information resources and systems. The systems refer to the searcher exploiting textbooks, databases, and journals as well as creating the methods and follow up on the search process (Yusuf, 2012).

The concept of information seeking behavior is rooted in several theories such as the Brenda Dervin's sense making theory (1983), the Zipf's principle of least effort published in 2004, and the Elfreda Chatman's life in the round theory (1999). These theories help to understand various processes that involve information seeking

(Kingrey, 2005). In a modern digital world, information seeking processes and behaviors have become an area of interest for libraries around the world. This is because earlier theories were focused exclusively on the information seeking and receiving and overlooked the central modality of the process. As information seeking behavior becomes more popular on the internet with the introduction of artificial intelligence to advance the analysis of searcher behavior, systems are likely to learn how users like, need, and search for information (Chauhan & Mahapatra, 2013)

The information seeking behavior has evolved significantly among professionals and researchers as a wide variety of sources emerge. The progress of modern societies as well as individuals depends a great deal upon the provision of the right kind of information, in the right form and at the right time. The nursing profession is in need of most current information in order to meet the clinical and educational needs (O'leary & Mhaolrunaigh, 2012). If information is this valuable, it must be put to proper use, i.e. made available to people or group of people who need it, after ascertaining the groups information needs and seeking behavior (Yusuf, 2012). Through searching for information for different purposes, in many situations, users develop a variety of behaviors to encounter, seek, comprehend and use information (Thani & Alam, 2011).

Medical and healthcare literature is growing exponentially, and medical professionals, including nurses, need to possess basic literature searching skills to retrieve information for clinical decision making (Majid *et al.,* 2011). Nursing and clinical professionals spend considerable time and efforts providing healthcare and medical treatment to patients. They need to use latest medical knowledge to support their healthcare practice as well as

provide necessary information to patients and their families (Clarke & Aiken, 2003). Many students and practitioners in the field of nursing find it convenient to obtain information from sources that are easily accessible and reliable. Because of the sensitivity of the profession, many students of nursing may prefer to seek for information from health care providers such as physicians and colleagues in the profession (Dee & Stanley, 2005).

Information seeking is a grand challenge and it is one of a considerable issue for Information Science (Thani & Hashim, 2011). With the increasing number of publications, it has become difficult for the information users typically the graduates to keep up with the fast expanding knowledge. With the increase in the availability of information, user expectations have risen substantially (Ijirigbo, 2009). Understanding the information needs of library clientele is necessary for planning and providing high quality library services, as well as to avoid misallocating resources. Understanding users' various strategies to seeking information in the new age, characterized by wide-spread and voluminous production and consumption of information, is also important. When librarians and other designers of information services understand users' information seeking behavior, they can adjust their services and resources to these patterns, and thus offer better services to the users (Safahieh, 2007).

Recognizing the importance of information for patient care, since the 1990s, nursing educators began to emphasize the importance of nurses' information skills, especially seeking and use of clinical information to effectively discharge their responsibilities (Dee & Stanley, 2005). Existing print and digital materials can supplement the information sought by searchers. Such print material

may include nursing textbooks and journals, government reports, reports from World Health Organization (WHO) as well as publications from research institutions (Kannampallil, Franklin & Mishra, 2013). The internet also provides a good source of information from databases and journals. Research findings have shown that these sources are immensely underutilized even as textbooks use is reduced and a minimum dependence on print journals. On the other hand, reports have shown that electronic sources such as MEDLINE and CINAHL are becoming popular with students even as the search for database does not indicate an increase in the use among the target users.

Vakkari (2008) states that information seeking is as a process of searching, obtaining and using information for a purpose. Information seeking is therefore an important part of learning process to nursing and clinical students. A number of factors including lack of access to the internet, large volume of nursing literature, and insufficient time for research have all contributed to a low uptake in information searching and retrieval among nursing students and practitioners (Younger, 2010).

1.1.1 Aga Khan University (AKU)

The Aga Khan University (Hospital), is part of the Aga Khan Health Services (AKHS) established in 1958. On 1 July 2005 the Hospital formally came under the management of the Aga Khan University (AKU). The AKU is an independent research university which is a tertiary, teaching and referral health care facility. Aga Khan University Library is committed to supporting the functions of the University in realising quality education and health care. In achieving its Mission, Aga Khan University operates on the core principles of quality, relevance, impact and access. Towards this goal, the

library strives to acquire and make available vast current resources in all formats to its users.

Aga Khan University Library is committed to supporting the functions of the University in realising quality education and health care. In this regard, the health sciences library supports the health sciences professionals and students in accessing information in the library. The library is proud to have rich collection in the health sciences area and will endeavour to make this a better collection and a point of reference for other institutions offering similar courses in Kenya.

The library's collections include books, current journals, and back files of journals, educational reports, audio/visual aids and digital media. They also provide access to online journals, books and other resources. Through the local consortium, the library benefits from the PERI online resources and the WHO HINARI database. The library also subscribes to e-databases like Up-To-Date, Cochrane and has access to others like Medline. Inducting users in the use of e-resources is a significant function of the library. The exercise is formally organized and remains continuous.

1.2 Statement of the Research Problem

Although nursing and clinical students are becoming more educated with growing proportion holding degrees, the literature has remained underutilized (Majid *et al.,* 2011). As a result, implementation of research findings into clinical practices is often delayed, and there remains a gap between what evidence is available and what is practiced. On average, it takes 17 years for clinical research to be fully integrated into everyday practice (Morris *et al.,*

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2011). Experience also suggests that most nurses and clinicians are unaware of new sources of health information, good sources of grey literature or unpublished materials, and they may not have used established sources of healthcare information (Majid *et al.,* 2011). A study by Thani and Hashim (2011) revealed that knowledge about how and why people exhibit different information seeking behavior is very little and it is also mentioned that research studies have not yet fully acknowledged information seeking as a dynamic process.

A review of the studies conducted in Kenya shows that there were limited empirical studies on information seeking behavior and information needs of healthcare students. For instance, Milton (2016) examined information seeking behaviour among health professionals in public health facilities in Garissa county, Kenya while Otieno *et al.* (2015) investigated the effect of library staff attitude to work on the use of information services in public university libraries in Kenya. These two studies were conducted in public university libraries, and therefore do not fill the gap of the study which sought to determine the information needs and information seeking behavior in medical libraries.

Investigating the information seeking behaviour can help to identify information seeking patterns of health professionals in medical libraries and establish how information seeking sources influence the users' decision on the search strategy, and challenges experienced by nursing and clinical students in accessing information (Milton, 2016). The Aga Khan University (AKU) health sciences library which solely supports the health sciences profession encounters students who struggle in accessing information. Moreover, due to time constraint, lack of access to relevant information sources, and lack of adequate information literacy skills, information needs are often not fully met. Aga Khan University Library

is committed to supporting the functions of the University in realising quality education and health care (AKU, 2018). This study therefore sought to fill that gap by examining the information needs and information seeking behaviour of nursing and clinical students in a health sciences library, with a focus on Aga Khan University, Kenya.

1.3 Aim of the Study

The aim of the study was to determine the information needs and information seeking behaviour of nursing and clinical students at Aga Khan University library.

1.3.1 Specific Objectives of the Study

The study was guided by the following specific objectives:

  i.   To find out the information sources used by nursing and clinical students at AKU library.

 ii.   To establish how nursing and clinical students obtain and access the required information for their medical practice decision-making.

iii.   To analyse whether the existing information sources in the library meet the needs of nursing and clinical students at AKU.

 iv.   To examine the challenges experienced by nursing and clinical students in accessing information at AKU library.

1.4 Research Questions

The study sought to answer the following research questions:

i.   What information sources are used by nursing and clinical students at AKU library?

ii. How do nursing and clinical students obtain and access the required information for their medical practice decision-making?

iii. How do the existing information sources in the library meet the needs of nursing and clinical students at AKU?

iv. What are the challenges that nursing and clinical students experience in accessing information at AKU library?

1.5 Significance of the Study

This study will be of value to AKU library staff. It will enlighten and give insight to the University library staff on information seeking behaviour and how to either improve or design it better so as to enhance student's information-seeking experience. This study will also enable the university library administration to improve and support the information needs of the nursing and clinical students.

The study will also be of significance to scholars and researchers. Primarily, the research would extend current knowledge of information-seeking behavior in the context of an academic domain thereby extending the body of knowledge on information behavior. This study will also be a basis for future research. The researchers will also gain deeper understanding of the concepts of information seeking behavior and retrieval.

1.6 Assumptions of the Study

An assumption is an unexamined belief. Assumptions are things that are accepted as true, or at least plausible, by researchers and peers who read a thesis or research paper. Assumptions are the ones that enable a researcher to have fundamental principles to carry out a given research. Assumptions therefore directly influence what kind of inferences one can reasonably draw from a research (Barroso, 2018). The study was based on the following assumptions:

The participants in the study (the nursing and clinical students using Aga Khan University library) answered the questions asked in the questionnaire in an honest and truthful manner.

The inclusion criteria of the sample are appropriate and therefore assure that the participants have all experienced the same or similar phenomenon of the study.

Participants have a sincere interest in participating in the research and do not any other motives.

The study also assumed that the questionnaire, as the data collection instrument would be adequate and valid to collect reliable data for the study to answer the study objectives.

1.7 Scope of the Study

Scope of the study is the definitions one set as the boundaries of their own study, so the scope in researcher's control. The scope include the choice of objectives, the research questions, variables of interest, and the population the researcher choose to investigate (Simon, 2011).

The study was carried out at Aga Khan University (AKU) library of health sciences which is located in Parkland, Nairobi County. The selected participants were nursing and clinical students studying at the university and the resident doctors who work at the hospital but use the library for their research and information needs. The staff working in the library were also included in the study as they are the ones to enforce effective information seeking behaviors among the students and other library users. Furthermore, students enrolled in other health sciences institutions but who used AKU resources for their research were not included in the study because the staff at the library could not be accessible.

1.8 Limitations of the Study

Limitations are potential weaknesses that arise in research and the researcher has no control over them (Wargo, 2015). The researcher anticipated that some of the respondents may fail to cooperate or give an honest opinion on the questions being asked. Others may fear about the confidentiality of their information that they give to the researcher. However, the researcher informed the respondents on the purpose of the study and also followed ethical procedures and ensured confidentiality so as to ensure that the respondents felt at ease to give data.

Another limitation was that the some respondents were unable to complete the questionnaires objectively due to time constraints. Some of the respondents were unwilling to be subjected to other time constraining activities by participating in a study that they did not think directly affect them. To address this, the study adopted 'drop and pick later' data collection method so as to give the respondents ample time to fill the questionnaires at their own free time.

1.9 Definition of Operational Terms and Concepts

Electronic material refers to online and digital information material found on the internet.

Information seeking behavior refers to processes and methods used by an information seeker to satisfy their information need. An information seeking person has a perceived information need that must be satisfied upon accessing the right information.

Information service provider refers to trained information professionals including the librarian who provide the information to information seekers.

Modeling Approach refers to a paradigmatic approach to social representations developed that integrates different methods and techniques coherently with the articulation of different theoretical constructs and dimensions.

Perceived information need is the extent to which an information seeker might feel satisfied with the information they get and use that particular information to solve a problem.

Print material refers to all published documents including journals, textbooks, reports, newspapers, magazines that can be accessed to provide information.

Systematic Approach refers to a process used to determine the viability of a procedure based on the experiential application of clearly defined and repeatable steps and an evaluation of the outcomes. The goal of a systematic approach is to identify the most efficient means to generate consistent, optimum results.

1.10 Chapter Summary

This chapter is the introductory section of the study. The chapter covered the background to the study, the problem statement which outlines the research problem indentified that prompted this study. The chapter also highlighted the objectives of the study, research questions, significance, assumptions and scope of the study. The chapter ends with a section on limitations of the study and definition of operational terms.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

A literature review is an essential part of the research process because it allows the researcher to access pertinent information with regard to the topic of study. The review is also important because it allows access to published findings by other researchers on the topic being studied and hence forms a foundation for carrying out the research using established theories and concepts. It is also the basis for a conceptual framework and gives the insight into procedures and methods that could be used to perform the study (Paré *et al.,* 2015). In this review of literature, three major areas will be reviewed; investigation of themes and sub themes in the area of information seeking behavior, identification of knowledge gaps, and exploration of empirical and intellectual studies on the topic of information seeking behaviors. The last section is an exploration of the conceptual framework to provide a diagrammatic representation of information seeking behavior and the concept of information needs among students of nursing and clinical studies.

Within an evolving and dynamic area of information science, which is heavily driven by the emerging technologies, researchers have developed a keen interest on how people search for information from the many available sources. Different studies for instance, Huurdeman and Kamps (2014) have shown that information seeking behaviors vary from one person to another and within groups of people with different characteristics. For example, students of clinical and nursing study are likely to search for information differently from students of engineering and physics. This is because the former is a dynamic area while the latter is more static in the way new concepts are churned out by researchers. For this reason, information seeking behavior must

evolve to suit the emergent needs but also corresponding to the existing sources of information.

2.2 Theoretical Framework

Theoretical framework is a summary of the theory regarding a particular problem that is developed through a review of previously tested knowledge of the variables involved. It is important to review the theoretical literature in order to gain an insight into the different sides and opinions that different schools of thought have (Grant & Osanloo, 2014). This section discusses the theories/models that are developed by other authors and which informs the study is anchored on. This study will be informed by Wilson's information behavior model (1981) and Ellis' model of information-seeking behavior (1989).

2.2.1 Ellis' Model of Information-Seeking Behavior (1989).

Ellis developed a behavioral model of the information-seeking behaviors of academic social scientists in 1989. This approach concentrates on the behavior instead of on cognitive activities. The model has six key components which correspond to types of information-seeking characteristics: starting, chaining, browsing, differencing, monitoring, and extracting. These components cover the overall search process and indicate that users do engage in multiple types of information-seeking strategies (Ellis, 1989).

Unlike Ellis (1989), Meh and Tibbo (2003) group the different search activities they identify in their research into four inter-related stages. These are: Searching which entail starting, chaining, browsing, monitoring, differentiating, extracting and networking. The second strage is processing which entails

chaining, extracting differentiating, verifying, information managing, synthesising, analyzing and writing. The third stage is accessing which entails decision making and lastly there is ending (Meho & Tibbo 2003).

Ellis and Haugan (1997) further modeled the information-seeking patterns of engineers and research scientists in relation to their research activities in different phases and types of projects. Similar behavior patterns were identified from this group of users: surveying, chaining, monitoring, browsing, distinguishing, extracting, filtering, and ending. Ellis' model starts a new behavior approach to identify information-seeking patterns of users and cited widely by researchers who developed other search models.

2.2.2 Wilson's Information Behavior Model (1999).

This study is anchored on Wilson's Information Behavior Model which was first developed in 1981 and later revised in 1994, 1996 and 1999. Wilson's model has changed over time, and will continue to evolve as technology and the nature of information changes (Wilson, 2010). The purpose of the model is to outline different areas that concern the information seeking behavior. This model attempts also to cover the holistic approach to information seeking behavior. Major ideas of the model are that information seeking behavior is a result of a perceived information need by an information seeking person (Wilson, 2013). One of the newest information behaviour models, published in 2013 by Andrew Robson and Lyn Robinson, is a good illustration of the complexity of studying information behaviour (Robson and Robinson, 2013). It illustrates the importance of knowing about user's context and on taking a user's context into account in information behaviour research.

In an attempt to satisfy the perceived need, the information user may make formal or informal demands on the existing systems of information and the result is either a success or a failure in the search process (Ikoja-Odongo & Mostert 2006). A successful searching process may make the information user to fully or partially satisfy the perceived information need. In the case where the need is not met, the information seeker will be forced to modify their seeking behavior in order to find more relevant and reliable information (Ikoja-Odongo & Mostert, 2006).

A limitation of the Wilson's information seeking behavior model is that little attention is given to the existing gaps in research and therefore does not suggest any causative factors for certain information seeking behavior. As a result, it could be difficult to form assumptions or hypotheses that help the information service provider to form informed choices on how to provide the information. The model to be used in this study is presented below:
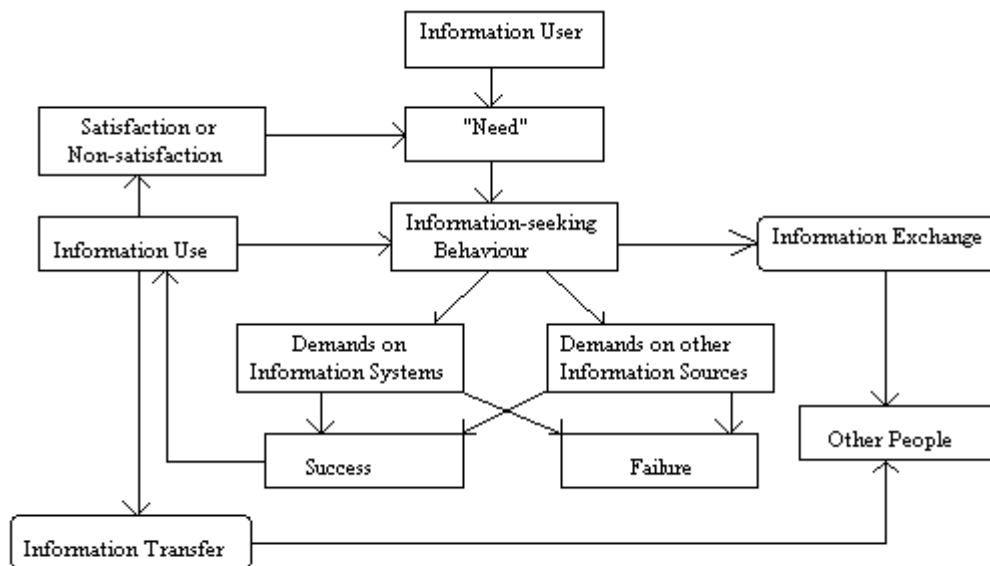
Figure 2.1: Wilson's information seeking behavior model (1999)

The model seeks to capture the information seeking process. It is based upon two main propositions: one is that information need is a secondary need that arises out of needs of a more basic kind; and two is that in the effort to discover information to satisfy a need, the enquirer is likely to meet with barriers of different kinds. This model was essential in helping understrand the information seeking process and the concepts of information needs and information seeking behavior.

2.3 Information Sources Used By Nursing and Clinical Students

A number of studies (for example, Curtis *et al.* 2007; Grajek *et al.* 2007) have reported that libraries are widely used resources for health information by students and health professionals. For instance, Grajek *et al.* (2007) evaluated use of information resources during the first year of IAIMS implementation at the Yale-New Haven Medical Center. Measures included monthly usage data for resources delivered network-wide in the Medical Library, and in the hospital; online surveys of library workstation users; an annual survey of a ndom, stratified sample of Medical Center faculty, postdoctoral trainees, students, nurses, residents, and managerial and professional staff; and user comments. The study found out that 83% of the Medical Center community use networked information resources, and use of resources is increasing. On the other hand, 88% of people use computers in more than one location, and increases in usage of traditional library resources such as MEDLINE are due to increased access from outside the Library. Both survey and usage data showed that students and health professionals were using multiple resources during the same information seeking session.

Dee and Stanley (2005) conducted a study on information-seeking behavior of nursing students and clinical nurses. One of the objectives of this study was to establish the source of information for clinical and nursing students. The study revealed that nursing students and clinical nurses were most likely to rely on colleagues and books for medical information, while other resources they frequently cited included personal digital assistants, electronic journals and books, and drug representatives. Significantly more nursing students than clinical nurses used online databases, including CINAHL and PubMed, to locate health information, and nursing students were more likely than clinical nurses to report performing a database search at least one to five times a week.

Majid *et al.* (2011) investigated the use of different medical information sources by nurses and their literature searching skills. A total of 1,486 nurses from two public hospitals in Singapore participated in this study. The study found out that human and printed sources were used more frequently by the nurses as compared to online sources. For literature searching, nurses were using basic search features, and less than one-quarter of them were familiar with Boolean and proximity operators. The study suggests that hospital libraries should play an active role in improving literature searching skills of nurses which may subsequently result in increased use of electronic information sources.

The above findings corroborate with those of Pors (2006) who conducted a research and found that students do not bypass the physical libraries and it is also evident that the use of physical libraries and digital resources complement each other. The place of google in the students' information

is prominent and positively correlated to use of traditional library resources.

Marshall *et al.* (2011) explored the preferred sources of information used by intensive care nurses and their perceptions of the accessibility and usefulness of this information for making decisions in clinically uncertain situations. The study established that people (colleagues) as information sources were considered most useful and most accessible in the clinical setting. Text and electronic information sources were seen as less accessible, mainly because of the time required to access the information within the documents.

Lacović (2014) examined Students' information behaviour and the role of academic library. The aim of these studies was to identify information needs, sources, and types of library use by the university students from various disciplinary fields. The results show that majority of the respondents needed the information for academic purposes (such as papers, assignments or examinations), frequently using information sources like books, journal articles, online sources etc. For many students the internet was a very important source in finding academic materials. Most of the students received advice in finding relevant information sources from their lecturers, peers, and librarians.

2.4 Strategies used by Nursing and Clinical Students to Access Information

Bates (2010) stated that over the past 50–60 years, research on information behavior has been referred to interchangeably in three different terms: user studies; information seeking or information needs and uses; and information behavior. Information seeking

behavior seems to be the most dominant and widely used term these days (Case, 2012). This may be explained as owing to its being a wider concept and a more comprehensive term encompassing all kinds of research on people's interaction with information (Bates, 2010). Information seeking can be defined as a process in which humans purposefully engage in order to change their state of knowledge (Marchionini, 1997). Moreover, information seeking behavior is defined as the set of activities a person may engage in when identifying his or her own needs for information, searching for information, retrieving information in any way, and transferring and using that information (Wilson, 2009).

A classification of various information-seeking strategies was first developed based on four behavioral dimensions which consists of; the goal of the interaction (learn, select), method of interaction (scan, search), mode of retrieval (recognize, specify), and types of resources interacted with (information, meta-information). Each type of information-seeking strategy corresponded to a specific prototype of dialogue structure (Belkin *et al.,* 1995).

Method of interaction can be understood in terms of the classic distinction between searching for a known item and looking around, or scanning, for something interesting among a collection of items. The goal of the interaction may be learning about some aspect of an item or resource, or selecting useful items for retrieval. Furthermore, looking for identified items can be characterized as retrieval by specification, while identifying relevant items through stimulated association can be characterized as retrieval by recognition. And interaction with information items themselves can be contrasted with interaction with meta-information

resources that describe the structure and contents of information objects (Belkin & Cool, 1993).

The underlying common dimensions of browsing - scanning (looking, identifying, selecting, and examining), resource (meta-information, whole object, and part of object), goal (locate, confirm, evaluate, keep up, learn, curiosity, and entertain), and object (specific item, common items, defined location, general, and none) - were identified to illustrate nine patterns of browsing (Chang, 1995).

Kakai, Ikoja–Odongo and Kigongo–Bukenya (2004) conducted a study of the information seeking behavior of undergraduate students of Makerere University, Uganda. Ellis' six generic information–seeking activities were tested to establish how undergraduate students sought information. The study found out that undergraduate students used the following search strategies when seeking information: Starting (using lecturers), browsing (on the shelves), chaining (using references at the end of books), monitoring (using the card catalogue, library notice board display lists, and colleagues), and extracting (using the card catalogue). The strategies are appropriate but the options used in each strategy are inadequate for the students to exhaustively achieve their goals.

2.5 Existing Information Sources and Needs of Nursing and Clinical Students

Senior student nurses require information for their research and practice during the clinical tests and practice. To compare their information seeking skills, Thain and Wales (2011) investigated the different approaches that nursing students are likely to embrace as the most effective in searching for information. He carried out the study

on senior nursing students to investigate the impact of different programs on the ability of these students to seek and access information. The strategies varied across the spectrum. Using a purposive approach strategy, Thain and Wales (2011) collected data and analyzed it in two phases. The study showed that there were similarities and differences between groups of students enrolled in different nursing programs. Students in integrated programs showed a greater tendency to a systematic approach when seeking for information, using textbooks, journals, and electronic materials, as well as databases to seek and access information. The same study revealed that general nurse students preferred a modeling approach to seeking and accessing information.

A nationwide survey by the Royal College of Nursing (2012) sought to instigate the information needs of nurses, health care assistants, and resident doctors in health institutions. The survey made a distinction between the required information for improvement of clinical practice and the information for support of lifelong learning and formal training. This distinction was significant because most of the nurses and resident doctors did not just seek information for formal learning but also to improve their performance in the clinical practice. Following this study by Royal College of Nursing (2012), it was found that nurses, irrespective of whether they are engaged in formal learning or not, used local sources to search for information for purposes of enabling them to give appropriate care to their patients. As such, they were more likely to depend on their coworkers such as nurses, doctors, and pharmacists to seek and find information for their needs. Further evidence from the study indicated that nursing and clinical students needed information for laboratory tests and keeping of patient records.

As an integrative review of information sources for nursing and clinical students, Spenceley, Chizawsky and Estabrooks (2012) carried out a study of information sources that are likely to be consulted by nurses to inform their practice. The researchers developed a scoring scheme to facilitate comparison across studies, and this resulted in a ranked list of sources stated across a large number of studies. The results of the study indicated that the source most often ranked within the top five was "registered nurses" followed by "nursing journals" and "reference material". Further, the researchers observed that "communication with others" had more top five rankings than any other category. This finding corroborated with that of Thompson *et al.* (2010) who found that "immediate colleagues were perceived as more accessible as a source of information for clinical problem solving than any form of evidence-based technology, and human information sources were overwhelmingly classed as most useful in clinical decision making" (Thompson *et al.*, 2010) p. 187).

On the reasons for seeking information, Vakkari (2008) found that nurses sought information for decision making about individual patients' care and for broader topics within nursing. In the same study, patient-specific information was the most frequently sought (49%). This was followed by institution-specific information (22%), knowledge about medications and conditions (21%), and procedure information (3%). Ozsoy and Ardahan (2008) found that nurses most frequently required information relating to drugs therapy and diagnosis. The sources they used most frequently were colleagues, drug reference manuals and protocol manuals. From this study, it is evident that the prevailing task at hand is an essential deciding factor when it comes to selecting a particular piece of information and the eventual processes of seeking and accessing the required

information. The task informs the perceived information need and the push to engage a process of seeking for information. The aspect of lifelong learning is pushed back as the urgency to solve the problem takes the center stage for seeking and accessing the information.

Al-Dousari (2009) conducted a study to explore the information needs and information seeking behaviour of doctors in Kuwait government hospitals (KGH). The aim was to investigate the internal and external information sources used by doctors in Kuwait government hospitals and to analyse whether the existing clinical information sources met their needs. The findings of the study show that the most frequently mentioned need for information was to be up-to-date to maintain good practice. It was found that interpersonal communication and a doctor's personal collection, consisting primarily of electronic resources, were the sources most frequently reported as used by the doctors. However, the degree of use of clinical information sources showed that doctors' information seeking varied depending on the clinical scenario. Doctors' knowledge and patient data were the doctors' most frequently used sources of information in the three clinical scenarios: outpatients, wards and the emergency department. There was a low use of knowledge-support resources such as the Internet and library resources in the outpatient and emergency rooms. However, use of the knowledge-support resources was highest in the wards.

2.6 Challenges Experienced by Nursing and Clinical Students in Accessing Information

A number of studies show that there are varied challenges that may hinder medical students to effectively access information they are seeking. For instance studies by Tannery *et al.* (2007) and Cogdill (2003) revealed that the common barriers to nurses' information seeking on the clinical unit are lack of access to the most relevant resources; search results that are too large to be useful; search results that retrieve information that is incomplete, inaccurate, inconsistent and non-evidences based; and information that is too difficult to read or understand.

In another study, Al-Dousari (2009) explored the information needs and information seeking behaviour of doctors in Kuwait government hospitals and showed some contextual factors either supported or hindered doctors in seeking the information they needed. The factors were categorised in the following contexts: organization context, socio-cultural context; information sources context and scenarios context.

Kumar and Suresh (2000) in their study on strategies for providing effective reference services for foreign adult learners pointed out that the barriers in effective utilization of library resources and services by international students were partly due to unclear role of the reference librarian, since foreign students sometimes felt that they may disturb the librarians with their questions. There were communication problems, due to the inability of library staff to understand the students and inability to clearly express their information needs because of lack of fluency in the language. This served as a barrier to students in their quest to accessing information in the library.

Jones, Schilling and Pesut (2011) conducted a study on barriers and benefits associated with nurses information seeking. The study found out that lack of knowledge about specific resource or use of online search engines, as well as previous negative experiences with specific resources, were important factors that hampered effective information searching and retrieval in clinical practice. In addition, the specific characteristics of information resources also posed barriers to effective use. Browser-based search engines, for example, maximize search results, leading to long, undifferentiated list of both appropriate and inappropriate information resources. Finally, organizational barriers such as hospital policies and procedures that dictated preference of intranet packages also werecited as barriers that discouraged the use of the web by nursing students.

Laki (2016) conducted a study to determine factors influencing health information-seeking behavior and utilization of ICT resources among health care providers to provide high quality health services. A cross sectional study was conducted in July 2008 among 202 health care providers in Tanga region, Tanzania. The results showed that health care providers located in urban areas were more likely to search health information and use it than those in rural areas. The study recommended that health care providers in both urban and rural health facilities should continuously be trained on how to search and use health information.

2.7 Conceptual Framework

A conceptual framework conceptualizes the relationship between variables in the study and shows the relationship graphically or diagrammatically

(Mugenda & Mugenda, 2003). In this study, the conceptual framework illustrates the interaction between independent variables and the dependent variable in the study. The independent variable was information seeking behavior while dependent variable is information needs of students. The framework is presented in Figure 2.1.

Independent Variable	Dependent Variable	Intervening Variable	Outcome Variable
• Information Sources • Technology	Users' inability use the Resources	• Improved user services • Staff training	• Improved Access. • Increased usage of library
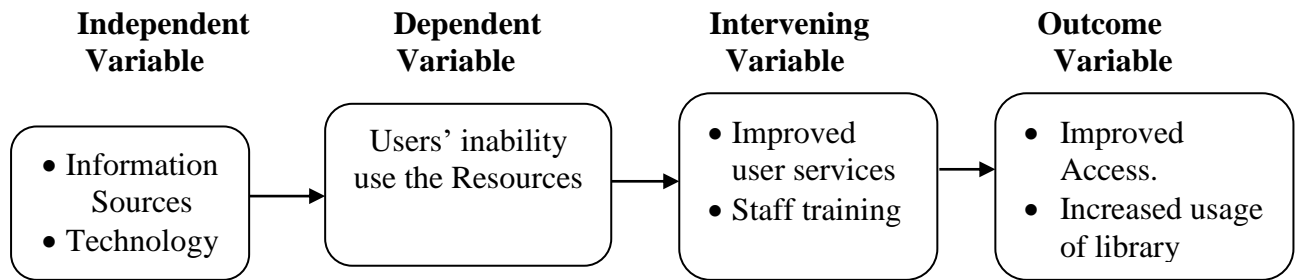
Figure 2.2: Conceptual Framework   **Source:** Author (2017).

2.8 Chapter Summary

This chapter presented the literature review. The chapter further presented the empirical studies and evidence in relation to the information needs and information seeking behaviour of nursing and clinical students. This involved a critique of the existing literature relevant to the study which helped to identify the research gaps. The chapter also discusses the theories/models that inform the study. The chapter ends with a presentation of the conceptual framework which shows the hypothesized relationship. The next chapter discusses the research methodology to be adopted for the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the research methods that were employed in the study to achieve the objectives. The chapter describes the research design, the target population and the sampling technique. It further highlights the data collection instruments and methods used in the study, the pilot study and data analysis techniques.

3.2 Research Design

Research design is the set of methods and procedures used in collecting and analyzing measures of the variables specified in the research problem research. It helps the researcher to systematically approach a scientific problem with the aim of finding the answers to that problem (McLaughlin, 2012). The study adopted a mixed methods research design. A mixed methods research is a methodology for conducting research that involves collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone (Creswell & Clark, 2011).

This was a case study of Aga Khan University. Case study research is a methodology which can take either a qualitative or quantitative approach. In the qualitative approach, case study refers to the in depth analysis of a unit (Yin, 2009). The importance of a case study is emphasized by Kothari (2009) who indicated that a case study is a powerful form of

qualitative analysis that involves a careful and complete observation of a social unit, irrespective of what type of unit is under study. The nature of the study will facilitate use of a questionnaires and an interview guides approach to data collection so as to help have a deeper understanding of the subject matter.

3.3 Area of Study

The study was done at Aga Khan University Library. The library is part of the Aga Khan University Hospital and provides information services to students of nursing, the staff at the hospital, including the resident doctors. In order to qualify to participate, one had to be enrolled as a student at Aga Khan University and registered with the library or one had to be a resident doctor working at the hospital.

3.4 Target Population

Target population refers to the entire group of individuals or objects to which researchers are interested in generalizing the conclusions (Bryman, 2012). The study population comprised of the clinical and nursing students who are the users of information services at the AKU library. The study also targeted the staff in the library in the University. The target population consisted of 100 subjects who included 88 clinical and nursing students and 12 staff in the library (librarians). The population of the study is presented in Table 3.1.

Table 3.1: Study Population

Population Subjects	Population Size	Percentage of total target population (%)
Library Staff	12	12
Clinical and nursing students	88	88
Total	**100**	**100**

3.4 Sample and Sampling Techniques

3.4.1 Sample Size

A sample is a small proportion of an entire population; a selection from the population (Bernard, 2013). The study used Krejcie and Morgan (1970) formula to determine the sample size. The formula is basically used for finite target population. Based on Krejcie and Morgan's table for determining sample size, a population of 100 gave a sample size of 80 respondents. The distribution of the sample size is shown in Table 3.2.

Table 3.2: Sample Size

Population Subjects	Population Size	Sample Size
Library Staff	12	10
Clinical and nursing students	88	70
Total	**100**	**80**

3.4.2 Sampling Techniques

Sampling is a method of studying from a few selected items, instead of the entire big number of units. The small selection is called sample (Mugenda, 2008). A sample of 70 nursing and clinical students and 10 library staff in AKU was selected through random sampling from a population of 88 nursing and clinical students in AKU and 12 library staff respectively. Random sampling gives each sample an equal probability of being chosen. A sample chosen randomly is an unbiased representation of the total population.

3.5 Data Collection Methods

The study used both qualitative and quantitative methods of data collection. The quantitative approach to research involves the process of

collecting observable and factual information through a scientifically proven method. As noted by Aliaga and Gunderson (2002), quantitative research involves the approach where numerical data is collected about a phenomenon, and analyzed. The importance of using quantitative research approach is that it provides the researcher with a subjective approach to wider phenomenon and the ability to collect the data that might be required to understand a generally wider topic. The quantitative approach to research allows the researcher to numerically code abstract concepts that would otherwise be difficult to measure scientifically.

On the other hand, qualitative approach involves an in-depth analysis that gives an in-depth picture and it is particularly useful for exploring how and why things have happened. Qualitative Research is used to gain an understanding of underlying reasons, opinions, and motivations. It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research. Qualitative research is also used to uncover trends in thought and opinions, and dive deeper into the problem.

The study therefore used both qualitative and quantitative methods of data collection. These approaches also helped the researcher to apply different methodologies such as questionnaires and interviews to collect data to investigate the problem of the researcher (Creswell & Clark, 2011).

3.7 Research Instruments

The study collected primary data. In quantitative method, the study used a questionnaire to collect data while in qualitative the study used interview guides.

3.7.1 Questionnaire

The questionnaires were designed to address the research questions and objectives and were administered to the clinical and nursing students in AKU. Questionnaires have been observed by researchers to be the ideal instrument for data collection in survey studies (Saunders, 2009). The questionnaire had a combination of both open and closed questions. The questionnaire collected data from clinical and nursing students who are users of the information services at AKU. The questionnaire was divided into three sections; section one collected demographics information, section two presented questions on information seeking behavior while section three covered questions on information needs. The questionnaire was considered as the appropriate data collection instrument for this study since it provides a high degree of data standardization. They are also relatively quick to collect information from people in a non-threatening way and heap to administer. Questionnaires are also able to give a detailed answer to complex problems (Kombo & Tromp, 2009).

3.7.2 Interview Guide

The second instrument that was used to collect data is the face-to-face interview guide. The researcher interviewed respondents to get in-depth information on the information needs and information seeking behavior. The interview guide helped probe and interrogate in-depth information from the library management and other library staff members. The interview guide was deemed fit for the study since it facilitated in-depth research which yields adequate data, details, and new insights. The interview guide also permitted face-to-face contact with respondents; provide an opportunity to explore topics in-depth and allow the interviewer to

explain or help clarify questions, increasing the likelihood of useful responses (Mugenda, 2008).

3.7.3 Pilot Study

The developed questionnaire was checked for its validity and reliability through pilot testing. Pilot test was conducted to detect any weakness in design of the data collection instruments for the study. The study subjected the questionnaire to 10 students from Mater Hospital Library, Nairobi to participate in the pilot study. Mugenda (2008) assert that a successful pilot study would use 1% - 10% of the actual sample size. The objectives of pre-testing were to allow for modification of various questions in order to rephrase, clarify and or clear up any shortcomings in the questionnaires before administering them to the actual respondents. The pilot study helped identify inconsistencies arising from the instruments, and give feedback to enable the researcher rewrite the questionnaire.

3.7.4 Validity of the Research Instrument

Validity indicates the degree to which an instrument measures the construct under investigation (Saunders *et. al.,* 2012). For a data collection instrument to be considered valid, the content selected and included must be relevant to the need or gap established. Internal validity of the questionnaire was established by the supervisor reviewing the items. Before the actual study, the instruments were discussed with supervisors. The feedback from the supervisors and the experts helped in modifying the instruments. This ensured that the questionnaire collects reliable information and also improves the response rate.

3.7.5 Reliability of the Research Instrument

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials. Reliability test measures the internal consistency of the questionnaire (Wong, Ong & Kuek, 2012). An instrument is reliable when it can measure a variable accurately and obtain the same results over a period of time. Reliability of the questionnaire was tested by Cronbach's alpha test with the help of Statistical Package for Social Sciences (SPSS). A co-efficient of above 0.7 implied that the instrument was sufficiently reliable for the measurement (Tavakol & Dennick, 2011).

3.8 Data Collection Procedures

Data was collected from clinical and nursing students and resident doctors who use the information services at AKU as well as the library staff in the Aga Khan University library. The researcher first sought permission to conduct the study from the relevant authorities in AKU. Necessary permits were also sought from the university and from the National Commission for Science, Technology and Innovation (NACOSTI).

Once permission wass obtained, the researcher was assisted by research assistants to administer the questionnaire and conduct interviews to the respective respondents. Each questionnaire was accompanied by a covering letter in which the purpose of the research was explained to the prospective respondent. A lead contact person was identified among the respondents. The lead contact person's responsibility was to constantly follow up on the respondents to complete the questionnaire and to collect the same. However, the researcher did not coerce anyone to participate in the study.

3.9 Data Analysis and Presentation

The study analyzed the data using qualitative and quantitative procedures. The collected data was thoroughly examined and checked for completeness and comprehensibility. Data was cleaned and entered into the Statistical Package for Social Sciences (SPSS Version 20) for analysis. The quantitative data was analyzed through descriptive statistics. The descriptive statistics such as means, standard deviation and frequency distribution were used to analyze the data. The quantitative data was presented using pie charts, bar charts, percentages and frequency tables.

The qualitative data generated from the interview guides and open ended questions was categorized in themes in accordance with research objectives. The data was then analyzed through content analysis and reported in narrative form along with quantitative presentation. This helped to draw conclusions, summarize and present the data in a form that would make it easier to understand the concept of the findings in relation to the problem being investigated.

3.10 Ethical Considerations

The Aga Khan University has a policy on ethical practice in research. Therefore, the information studies ethics policy was followed. One of the areas to consider is the Code of Professional Practice set out for students and nurses at the hospital. The researcher also sought advice on other requirements outside the AKU for approval. Participants were given an informed consent form to get a brief overview about the study. This is in line with Pickard (2013) observation about participant consent, noting that participants must understand the objectives of the study before agreeing to participate. This made them comfortable with the research.

Another critical aspect is the confidentiality of respondents especially on data obtained from the interview. To ensure confidentiality, the respondents were requested not to indicate their names on the questionnaire. The information given by the respondents was treated confidential and was used for the purpose of this study only.

The researcher also avoided plagiarism when carrying out the study. Plagiarism is an academic offense which will be avoided by attributing the source of information through in-text citation and acknowledgement of the source in a reference section.

3.11 Chapter Summary

This chapter outlines the methodology used in the research study. It describes the research design that was adopted, the study population, and the sampling technique. The chapter further presents the data collection instrument and procedures, and the data analysis procedures which outline how the collected data was summarized into meaningful results to address the research objective. The chapter ends with a section on ethical considerations that were followed in this study. The next chapter covers the data analysis and discussion of the study results.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the results and findings as analyzed from the data collected. The data analysis was based on the study objective which sought to investigate the information needs and information seeking behavior of nursing and clinical students in medical libraries, with a focus on Aga Khan University. The responses were analyzed using descriptive statistics and results were presented in tables, charts and graphs.

The study sample size was 80 clinical and nursing students and 10 library staff in AKU. Responses from 62 clinical and nursing students, and 9 library staff were successfully received in time which translates to a response rate of 88.6% and 90% respectively. The response was appropriate for the study to continue and provide reliable results. Mugenda and Mugenda (2003) argues that a fifty percent response rate is adequate, sixty percent good and above seventy percent rated very well. The response rate is shown in Table 4.1.

Table 4.1: Response Rate

Respondents	Response		No Response		Total Sample Size	
	F	%	F	%	F	%
Clinical and Nursing Students	62	88.6%	8	11.4%	**70**	**100%**
Library staff	9	90.0%	1	10.0%	**10**	**100**

4.2 Respondents Profile

This section presents the demographic information of the respondents. The respondents' demographic information reflects the relevant attributes of the population; it forms the basis under which the study can rightfully access the relevant information. The respondents' information captured included: gender, level of education and number of years worked in the organization.

4.2.1 Gender of Respondents

In this section, the study sought to establish the gender of the respondents who took part in the study. The information on gender was important in order to establish the composition of both male and female clinical and nursing students using the AKU library. The study findings show that 51.6% of the clinical and nursing students were male while 48.4% were female. This shows that there was good composition of both genders in the study. The responses were from both male and female students. From the findings, it can be deduced that the number of male and female clinical and nursing students using the AKU library were almost equal, though the number of male students was slightly high. The findings are presented in Figure 4.1.
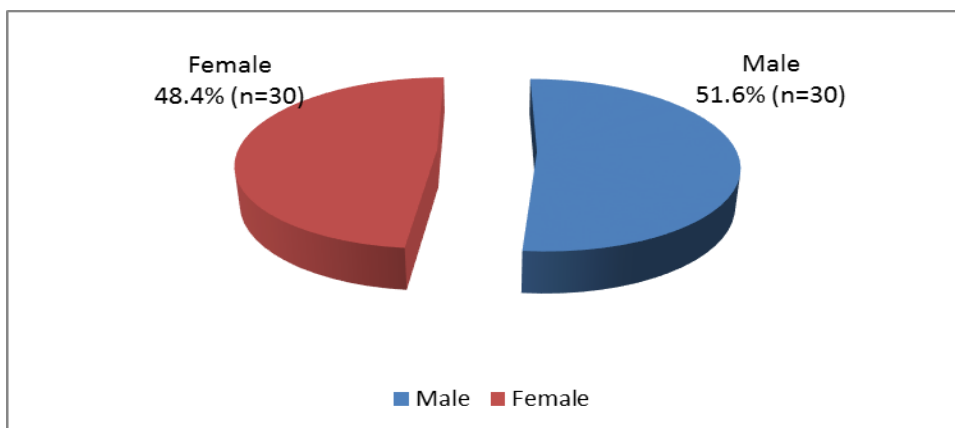

Figure 4.1: Gender of Respondents

4.2.2 Age of the Respondents

The respondents were asked to indicate their age. The age was captured in structured age brackets. Information on age was important since it would help establish the age composition of the nursing and clinical students using the AKU library. The study findings in Table 4.2 show that most of the clinical and nursing students were between 31–40 years while 29% were between 20-30 years. Further, 22.6% of the respondents indicated that they were between 41-50 years. This shows that majority of the clinical and nursing students in AKU were young adults ages 40 years and below which is considered as the most productive years of a person. In relation to the study, most students in this age brackets are more likely to be active in the library or using the library more frequently as they seek to learn more and advance their career.

Table 4.2: Age of the Respondents

Age (in Years)	Frequency	Percent
41 – 50	18	29.0
31 – 40	30	48.4
41 – 50	14	22.6
51 and above	-	-
Total	**62**	**100.0**

4.2.3 Respondents' Level of Education

The clinical and nursing students were asked to indicate the highest level of education they had attained. The study results in figure 4.2 show that 45.2% of the clinical and nursing students had attained a Bachelor's degree. On the other hand, 35.4% of the respondents indicated that they had attained a Diploma while 19.4% had reached Masters Level as their highest level of education. This shows that the majority of

students had already attained high level of education as majority had a Bachelors and Masters degree. High education is associated with great knowledge and therefore it improves the reliability of the information given by the respondents in relation to the matters of information seeking behavior under study.
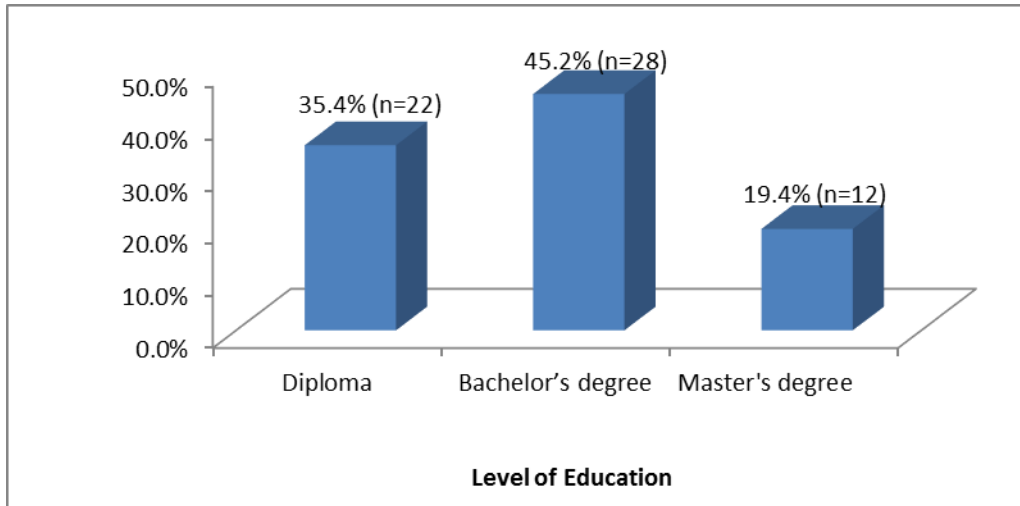
Figure 4.2: Level of Education

4.2.4 Position in the Library

The library staff were asked to indicate the position they were holding in the AKU library. This information was necessary in order to know the stature of the respondents who gave information of the study. The study findings in Table 4.3 show that 77.8% of the library staff were library attendants while 11.1% of the respondents were library supervisor and library manager respectively. By knowing the position the respondent holds in the library, it improves the reliability of the information given as one is able to ascertain whether that respondent was capable of giving reliable information on the subject matter.

Table 4.3: Position in the Library

Position	Frequency	Percent
Library Attendants	7	77.8
Library Supervisor	1	11.1
Library Manager	1	11.1
Total	**9**	**100.0**

4.2.5 Duration worked in AKU library

The library staff were asked to indicate the number of years they had worked in AKU library. This was important since the duration worked would enhance the credibility and reliability of the information given by the respondents. The study results in Table 4.4 show that 55.6% of the library staff had worked in the library for a duration of 5 to 10 years while 44.4% had worked in the university library for more than 10 years. From the findings it can be deduced that the respondents had worked for a substantial duration, and could give reliable information on the subject matter.

Table 4.4: Duration worked in AKU library

Position	Frequency	Percent
Less than 5 years	-	-
5-10 years	5	55.6
Above 10 years	4	44.4
Total	**9**	**100.0**

4.3 Information Sources Used By Nursing and Clinical Students

This section seeks to address the first objective of the study which sought to investigate the information sources used by nursing and clinical students at AKU library. To achieve this, the respondents were asked to indicate how frequent they use the library and the types of resources they search in the library.

4.3.1 Frequent of Use of the Library

The clinical and nursing students were asked to indicate the extent to which they attended the library to look for information sources. The study findings in Figure 4.3 show that 41.9% of the nursing and clinical students used the library at least once a fortnight while 29% indicated that they used the library at least once a week. Only 6.5% of the respondents indicated that they used the library daily while 22.6% revealed that they used the library at least once a month. From the findings majority of the respondents went to seek information from library frequently at least once in a week or in two weeks. This improves the reliability of the information given by the respondents since majority of them used the frequently.
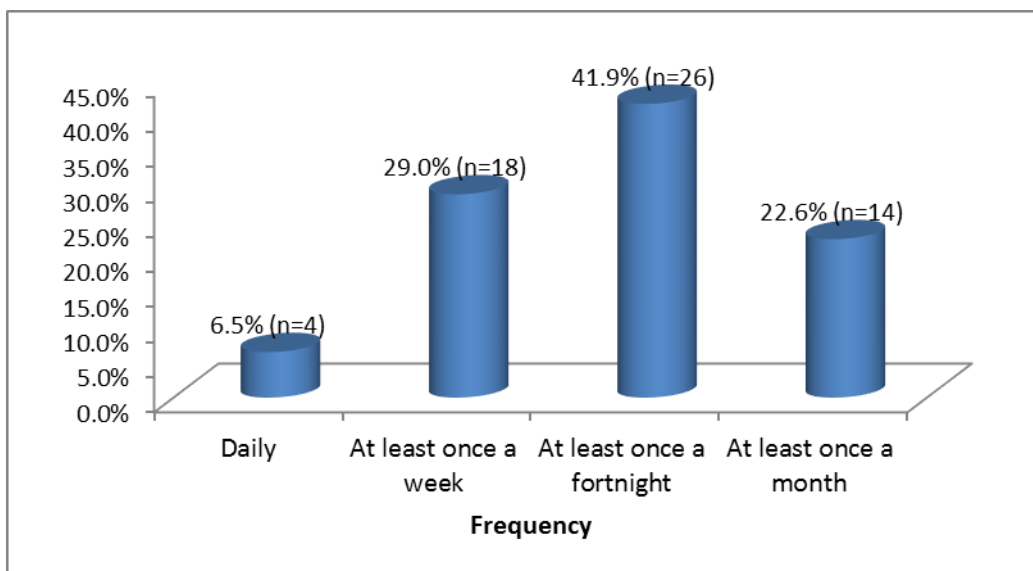
Figure 4.3: Frequent of Use of the Library

4.3.2 Types of Resources the Students Seek in the Library

The respondents were asked to indicate the types of information resources they sought or searched in the library. The study findings in Table 4.5 show that majority (82.3%) of the students indicated that they went to the library to search for online resources while 77.4% went to the library to look for journals. A further 67.7% of the students

indicated that they went to the library to look for text books while only 35.5% went to look for newspapers/ magazines.

From the findings, online electronic-resources, journals and books were the most used information resources by the nursing and clinical students in AKU. These findings are in agreement with those of Dee and Stanley (2005) who also established that nursing students and clinical nurses were most likely to rely on books electronic journals and online databases. Marshall *et al.* (2011) also established that other than use of colleagues and peers to get medical information, text and electronic information sources were also used.

Table 4.5: Types of Resources the Students Seek in the Library

Types of Information Resources	Frequency	Percent
Text books	42	67.7
Journal	48	77.4
Newspapers/ magazines	22	35.5
Online Resources	51	82.3

4.3.3 Type of Information Resources the Students Looked for in the Library

The library staff were also asked to indicate the type of information resources that clinical and nursing students mostly looked for in the library. The library staff indicated that the students were majorly searching electronic journals from online databases, such as CINAHL and PubMed and other electronic resources. Others were looking for medical magazines, articles and books. These findings are in agreement with those of Marshall *et al.* (2011); Dee and Stanley (2005) who also revealed that nursing students and clinical nurses were most likely to rely on books electronic journals and online databases.

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The library staff indicated that the information materials in the library were available and accessible to the students when they needed it. The respondents revealed that the library was keen to keep up with the information needs of the students.

4.4 Access of Information by Students for Clinical Decision-Making

This section addressees the second objective of the study which sought to establish how nursing and clinical students obtained and accessed the required information for their clinical decision-making in the library. The study enquired from the students on the strategies they used to search and access information in the library,

4.4.1 Seeking for information in the Library

The study sought to establish the students starting point for seeking information in the library. A five point likert scale was used to interpret the responses whereby the scores of "Not at all" and "small extent" were represented by mean score, equivalent to likert scale (1≤small exent≥2.5). The scores of 'moderate' were equivalent to 2.6 to 3.5 on the likert scale (2.6≤moderate≥3.5). The scores of "great extent" and "very great extent" were equivalent to (3.6≤Great Extent≥5) on the likert scale which shows a strong agreement with the statement.

The study findings show that majority of the students indicated that they used lecturers as my starting point for seeking information (mean score = 4.24) to a great extent; others used official publications as their starting point for seeking information (mean score = 4.20) to a great extent. On the other hand the respondents also indicated that they used the library as their starting point for seeking information (mean score 4.08) to a great extent as well use of personal collections as their starting point for seeking information (mean score = 3.90). However, the respondents indicated that they used professional colleagues and internet as their starting point for

seeking information to a moderate extent, as shown by a mean score of 3.09 and 3.13 respectively. The results are presented in Table 4.6.

From the findings, the respondents indicated that they not only used lecturers as their starting point for seeking information, they also used the library, and official publications as their starting point for seeking information. A study by Pors (2006) found that students greatly used physical libraries; students rely heavily on libraries for hard copy materials such as books, journals and papers, as well as for online resources. It is evident that the use of physical libraries and digital resources complement each other.

Table 4.6: Seeking for information in the Library

Information Seeking Behavior	Mean	Std. Deviation
I use lecturers as my starting point for seeking information	4.24	0.690
I use professional colleagues as my starting point for seeking information	3.09	0.738
I use official publications as my starting point for seeking information	4.20	0.625
I use the internet as my starting point for seeking information	3.13	0.727
I use personal collections as my starting point for seeking information	3.90	0.696
I use the library as my starting point for seeking information	4.08	0.684

The students were further asked to indicate other ways they used to seek or search for information in the library. Some of the respondents stated that they sought information through communicated with peers while others indicated that they had subscribed to electronic databases, where they accessed e-books and journals, which are categorized in various subjects/specialization, hence making it easier to access the

information they want. The above findings are in agreement with those of Grajek *et al.* (2007); Dee and Stanley (2005) who found that medical students had multiple sources of information which included traditional library resources and electronic sources such as online databases, for example CINAHL and PubMed, for medical information.

4.4.2 Request for Help in the Library

The library staffs were asked whether the students requested for help when searching for Information in the library. All the respondents revealed that the students requested for help whenever they could not trace or get the information they were searching for in the library. The respondents indicated that they assisted the students in browsing to access or retrieve information from online resources. The library staff also indicated that they helped the students trace the information materials on the shelves. They also helped the students to photocopy or scan the information they needed from the library.

The above findings are in line with those of Otieno, Otike and Rotich (2015) who conducted a study on the effect of library staff attitude to work on use of information services in public university libraries in Kenya, and found out that majority of the students find it difficult to trace the books in the library and students acknowledged that the library staff were essential in helping them to get information materials easily. The findings also corroborates with those of Lacović (2014) who found that most of the students received advice in finding relevant information sources from the librarians.

4.4.3 Search Strategies to Access Information in the Library

The respondents were asked to indicate the extent to which they used the following search strategies to access information in the library. A five point likert scale was

used to interpret the responses whereby 1 represented strongly disagree while 5 represented strongly agree. The study results in Table 4.7 shows that the respondents agreed that they used Keyword search strategy (mean score = 4.53), subject search strategy (mean score =4.51), title search strategy (mean score =4.32) and author search strategy (mean score =4.29). These were the major search strategies used by the students in the library. On the other hand, the respondents also agreed that they searched from the Worldwide Web (mean score =3.89) as well as Browsing in libraries or archives (mean score =3.84).

The findings are in agreement with that Eke, Omekwu and Agbo (2014) who examined search strategies employed by library and information science students and found out that the search strategies employed by the students includes: key word searching, title search, browse by title, browse by subject and sourcing information from the university library database.

Table 4.7: Search Strategies to Access Information in the Library

Search Strategies	Mean	Std. Deviation
Keyword search	4.53	0.992
Title search	4.32	0.647
Author search	4.29	1.168
Subject search	4.51	0.662
Browsing in libraries or archives	3.84	0.898
Searching the Worldwide Web	3.89	0.626

4.4.4 Information Seeking Strategies used by Library Staff to Help the Students

The study also enquired from the library staff on the information seeking strategies they used to help the students get the information they needed in the library. The respondents revealed that they majorly used 'Title search' or 'Subject search' since

the information materials in the library were arranged based on Subject area or Title of the materials. Some of the respondents also indicated they used Keyword search to help the students access the information materials in the library. The findings are in line with those of Eke *et al.* (2014) who revealed that students used search strategies such as: key word searching, title search, browse by title, browse by subject and sourcing information from the university library database.

4.5 Information Sources and Needs of Students

This section addresses the third objective of the study which sought to analyse whether the existing information sources in the library meet the needs of nursing and clinical students at AKU. To achieve this objective, the respondents were asked to indicate the purpose of seeking information, they were seeking for and the satisfaction with the information sources they get in the library.

4.5.1 Purpose of Information Seeking

The respondents were asked to indicate the purpose of information they were seeking in the library. The study results in table 4.8 show that majority of the students (82.3%) indicated that they were seeking information in the library for the purpose of preparing class notes; 77.4% were seeking information to enable them write reports or research papers while 72.6% were seeking information to help them in their class work (continuing education). On other hand, 67.7% of the respondents indicated that they sought information in the library to improve their knowledge in their area of practice while 51.6% indicated that they sought information in the library to help answer patients' questions. Only 19.4% of the respondents indicated that they sought information for general awareness and personal development.

From the findings, the nursing and clinical students sought information for the purpose of preparing class notes, write reports, improve their knowledge in the area of practice and help them answer patients' questions. The above findings are in agreement with those of Royal College of Nursing (2012) who indicated that nursing and clinical students sought information for their formal learning, to improve their performance in their practice, including information to help them carry out laboratory tests, keep patient records, and enable them to give appropriate care to their patients. Ozsoy and Ardahan (2008) also found that nurses frequently sought information for the purpose of improving their knowledge on drugs therapy and diagnosis

Table 4.8: Purpose of Information Seeking

Information Needs	Frequency	Percent
General awareness and Personal development	12	19.4
Improving my knowledge in my area of practice	42	67.7
To help answer patients questions	32	51.6
Keeping up-to-date information in my area of practice	34	54.8
Continuing education – Class work	45	72.6
Writing reports/research paper	48	77.4
Preparing class notes/Class work	51	82.3

4.5.2 Satisfaction with the Information Sources in the Library

The respondents were asked to indicate the extent to which they were satisfied with the information sources sought in the library. A five point Likert scale was used to interpret the results where 1 represents Not at all satisfied, while 5 represents extremely satisfied. The study results in table 4.9 show that majority of the respondents revealed that they were very satisfied with the information sources in the AKU library as shown by a mean score of 4.20. The respondents also revealed that the information materials at AKU library were adequate to meet their information

needs (mean score = 4.39). Moreover, the respondents indicated that they were very satisfied that the information materials were generally available and accessible (mean score = 3.88). According to Al-Dousari (2009), the degree of use of information sources is varied depending on the medical/clinical scenario and as a result the satisfaction levels are also varied.

Table 4.9: Satisfaction with the Information Sources in the Library

Satisfaction with Information Sources	Mean	Std. Deviation
I am satisfied with the information sources in the AKU library	4.20	0.808
The information materials are generally available and accessible.	3.88	0.192
The information materials at AKU library are adequate to meet my information needs.	4.39	0.506

4.5.3 Adequacy of Information Materials.

The library staff revealed that the information sought by the clinical and nursing students in the library was adequate to meet their information needs. The library staff were of the opinion that the information materials in the library were adequate to meet students' information needs. The library staff indicated that AKU library had current, up-to-date and relevant information to clinical and nursing to improve their performance in the clinical practice. The respondents indicated that the students needed information for laboratory tests, keeping of patient records and information relating to drugs therapy and diagnosis, which were available in the library.

The above findings are in line with those of Vakkari (2013) who found that clinical and nursing students sought information for decision making about individual patients' care, and get knowledge about medications and conditions. The same

sentiments are shared with Ozsoy and Ardahan (2008) who found that nurses sought information they frequently required relating to drugs therapy and diagnosis.

4.6 Challenges Experienced by Nursing and Clinical Students

The clinical and nursing students were asked to indicate the major challenges that they experience when obtaining information in the library. The respondents indicated that there few computers and online facilities for the use of their students, which were always full. They also had challenges of accessing electronic database due to slow internet in the library. **Some library staff were not conversant with some online search engines and could not give much help.** The respondents also revealed that there was increased traffic of students using the library which a times overwhelmed the staff, and therefore could not accord enough time to all the students queries. As a result, most students relied on their own skills to search for information/materials in the library. A few respondents also indicated that some staff attendants were not conversant with all the information materials they needed, and hence they did not get much help from the library staff.

On the part of library staff, the respondents revealed that some electronic resources were complex for both readers and the librarians. Some e-resources could not be accessed outside the library. The respondents also indicated that they had challenges in keeping up with a rapidly changing medical field, and a times the library did not have all the information materials that the students needed, at that particular time.

The above findings are in agreement with those of Al-Dousari (2009) who showed that some contextual factors hindered access or obtaining information they needed. The contextual factors were categorised as: organization context, socio-cultural context; information sources context and scenarios context. These findings are

also supported by Jones *et al.* (2011) who found out that lack of knowledge about specific resource or use of online search engines, as well as previous negative experiences with specific resources, hampered effective information searching and retrieval in clinical practice.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter provides a summary of key findings, conclusions and recommendations of the study based on the objectives of the study. This entails a synthesis of key issues of the objectives of the study as deduced from the entire research.

5.2 Summary of Key Findings

This section of the study presents the summary of key findings in the study. The summary of findings is based on the study objectives.

5.2.1 Information Sources Used By Nursing and Clinical Students

On the information sources used by nursing and clinical students, the study found out that majority of the students (82.3%) indicated that they searched for online electronic- resources in the library, journals and text books. However, a few also went to look for newspapers/ magazines. On the other hand, most of the students (41.9%) revealed that they used the library at least once a fortnight while a few others indicated that they used the library at least once a week and at least once a month.

The library staff indicated that the students were majorly searching electronic journals from online databases, such as CINAHL and PubMed and other electronic resources. Others were looking for medical magazines, articles and books. The library staff further indicated that the information materials in the library were available and accessible to the students when they needed it. The respondents revealed that the library was keen to keep up with the information needs of the students.

5.2.2 Access of Information by Students for Clinical Decision-Making

On the information seeking behavior, the study the students indicated that they used lecturers as well as official publications as their starting point for seeking information to a great extent. The students further indicated that they used the library and personal collections as their starting point for seeking information to a great extent. The respondents also indicated that they used professional colleagues and internet as their starting point for seeking information to a moderate extent. Others indicated that they had subscribed to electronic databases, where they accessed e-books and journals, and other electronic resources.

On the search strategies used by the students in the library, the study found out that the students majorly used the Keyword search strategy, subject search strategy, and title search strategy and author search. These sentiments concurs with those of the library staff who also revealed that they majorly used 'Title search' or 'Subject search' since the information materials in the library were arranged based on Subject area or Title of the materials.

The library staff acknowledged that the students requested for help whenever they could not trace or get the information they were searching for in the library. The library staff indicated that they assisted the students in browsing to access or retrieve information from online resources. The library staff also indicated that they helped the students trace the information materials on the shelves. They also helped the students to photocopy or scan the information they needed from the library.

5.2.3 Information Sources and Needs of Students

On whether the information sources in the library met the needs of the students, majority of the students indicated that they seeking information in the library for the purpose of preparing class notes and to enable them write reports or research papers. The students also indicated that they were seeking information to help them in their class work, to improve their knowledge in their area of practice and to help answer patients' questions.

Majority of the students revealed that they were very satisfied with the information sources in the AKU library. The respondents also revealed that the information materials at AKU library were adequate to meet their information needs. Moreover, the respondents indicated that they were very satisfied that the information materials were generally available and accessible.

These findings are in agreement with those of the library staff who indicated that AKU library had current, up-to-date and relevant information to clinical and nursing to improve their performance in the clinical practice. The library staffs were of the opinion that the information materials in the library were adequate to meet students' information needs.

5.2.4 Challenges Experienced by Nursing and Clinical Students

On the challenges that the students experienced in accessing information in the library; the students indicated that they a times had challenges of accessing electronic database due to slow internet in the library. The library staff were also not all skilled in electronic search engines or were not conversant with all the information materials they needed, and therefore could not give much help, to the students. On the other hand, the library staff indicated that some electronic resources were complex for both

readers and the librarians. There were also challenges in keeping up with a rapidly changing medical field, and a time the library did not have all the information materials that the students needed.

5.3 Conclusions

5.3.1 Information Sources Used By Nursing and Clinical Students

The study concludes that nursing and clinical students in AKU made more use of all available resources. The students went to the library mostly to search for online electronic-resources, journals and text books. However, a times the students did not get all the information they needed in the library. Unavailability of some materials would mean the students are not able to meet all their information needs.

5.3.2 Access of Information by Students for Clinical Decision-Making

The study concludes that the nursing and clinical students in AKU had varied searching skills. **The students majorly used the Keyword search strategy, subject search strategy, title search strategy and author search**. When searching for materials, some students used lecturers and professional colleagues as their starting point while others used official publications as their starting point, to search for materials in the library. The students rarely used the librarians as their starting point for seeking information.

5.3.3 Information Sources and Needs of Students

 The study concluded that the students were eager get information on patient care and to help answer patients' questions, improve their knowledge in their area of practice and get up-to-date information in their area of practice. The students also sought information in the library to help them in their class work. The students were very

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satisfied with the information sources in the AKU library since it met their information needs.

5.3.4 Challenges Experienced by Nursing and Clinical Students

The study concluded that the nursing and clinical students experienced challenges while accessing information materials in the library. The students experienced challenges of accessing electronic database especially when there is slow internet in the library. Some of the library staff were also not all skilled in electronic search engines, while others were not conversant with all the information materials they needed, and therefore could not assist the students effectively. There were also challenges in keeping up with up to date information sources, and a time the library did not have all the information materials that the students needed for use.

5.4 Recommendations

5.4.1 Information Sources Used By Nursing and Clinical Students

The study recommends that the university library should endavour to provide all the information materials that the students need. It was found out that a time the library did not have all the materials they needed at a particular time. The library should collaborate with the students so as to ensure that the students are able to get up to date information materials that they need.

5.4.2 Access of Information by Students for Clinical Decision-Making

The study recommends that the AKU library management and staff should endavour to provide adequate computer and online facilities for the use of their students, so as to enable them to have more access to information materials. The library should provide different online or virtual

platforms of access for the student nurses, so that the barriers of distance and lack of time to come to the library will be reduced.

5.4.3 Information Sources and Needs of Students

There should be greater collaboration between students and librarians so as to ensure the students have all the information materials they need in the library so that they can meet their information needs. Students should be guided to develop personal skills in searching for information in the library. Most specifically, the librarians should guide the students on how to use online databases which are the best sources in the library since they can get up-to-date information that the students' needs for their practice or class work.

5.4.4 Challenges Experienced by Nursing and Clinical Students

Moreover, the study established that the some of the library staff were also not all skilled in electronic search engines, while others were not conversant with all the information materials they needed, In this regard, the study recommends that the AKU library management should offer training or send some staff for training so as to educate them on how to effectively use electronic search engines; and also on information sources used by nursing and clinical students.

5.5 Recommendations for Further Research

This study sought to determine the information needs and information seeking behaviour of nursing and clinical students in medical libraries in Aga Khan University library. This was a case study of one medical library, that is, AKU. The study recommends that a similar study be conducted in other medical libraries in the country for comparison of results.

Secondly, with the increased use of technology even in the libraries, future studies should look at how technology has influenced information seeking behaviour by nursing and clinical students in medical libraries.

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<center>**APPENDICES**</center>

Appendix 1: Introduction Letter

Dear Respondent,

RE: INTRODUCTION LETTER FOR RESEARCH

I am a Masters student in the Faculty of Arts and Humanities, Department of Information and Library Science, University of Nairobi. I am currently carrying out a research on information seeking behavior among nursing and clinical students in medical libraries. The aim of the study is to: investigate the information needs and information seeking behavior of nursing and clinical students in medical libraries. Aga Khan University has been chosen as the case study.

I therefore request you to assist me by filling the attached questionnaire as part of my data collection process.

Please do not write your name or any other identifying information anywhere on the questionnaire. The information that you provide is purely for use in this study only and shall be treated with strict confidence.

Thank you in advance for your cooperation.

Yours sincerely,

Catherine Wanyingi

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Appendix II: Questionnaire

This questionnaire consists of five parts; kindly answer all the questions by ticking in the appropriate box or filling in the spaces provided.

Section A: Demographic Information

1. Indicate your gender?

       Male ☐   Female ☐

2. Indicate your age bracket:

       20 – 30 years ☐   31 – 40 years ☐

       41 – 50 years ☐   51 years and above ☐

3. Highest education level

       Diploma ☐   Bachelor's degree ☐

       Master's degree ☐   PhD ☐

       Other (Please Specify)..

Section B: Information Sources

5. How frequent do you use the library?

       Daily   ☐

       At least once a week   ☐

       At least once a fortnight   ☐

       At least once a month   ☐

6. Which types of resources do you seek in the library?

       Text book   ☐

       Journal   ☐

       Newspapers/ magazines   ☐

       On line e-resources   ☐

       Others (specify)……………………………………………………

Section C: Information Seeking Behavior

7. How do you start seeking for information that you need in the library? Use a scale of 1-5, where 1 Not at all, 2 is Small extent, 3 is Moderate extent, 4 is Great extent and 5 is Very great extent

Information Seeking Behavior	1	2	3	4	5
I use lecturers as my starting point for seeking information					
I use professional colleagues as my starting point for seeking information					
I use official publications as my starting point for seeking information					
I use the internet as my starting point for seeking information					
I use personal collections as my starting point for seeking information					
I use the library as my starting point for seeking information					

8. Which other ways other than the one highlighted above do you use to seek for information? …………………………………………………………………………
………...………………………………………………………………………..
………………………………………………………………………………………

9. To what extent do you use the following search strategies to access information in the library? Use a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree

Search Strategies	1	2	3	4	5
Keyword search					
Title search					
Author search					
Subject search					
Browsing in libraries or archives					
Searching the Worldwide Web					

Section D: Information Sources and Information Needs of Nursing and Clinical Students

10. Which of the following information needs apply to you? (Tick All that Apply)

Information Needs	Yes	No
General awareness and personal development		
Improving my knowledge in my area of practice		
To help answer patients questions		
Keeping up-to-date information in my area of practice		
Continuing education – Class work		
Writing reports/research paper		
Preparing class notes		

11. Please indicate any other purpose of seeking information in the library?...............

…………………………………………………………………………………………

…………………………………………………………………………………………

12. To what extent are you satisfied with the information sources you get in the library? Use a scale of 1 to 5 where 1 is Not at all satisfied, 2 – slightly satisfied, 3 – moderately satisfied, 4 – Very satisfied and 5 – Extremely satisfied

Satisfaction with Information Sources	1	2	3	4	5
I am satisfied with the information sources in the AKU library					
The information materials are generally available and accessible.					
The information materials at AKU library are adequate to meet my information needs.					

13. What are the major challenges that you experience when obtaining information in the library? …………………………………………………………………………......

……………………………………………………………………………………….…

………………………………………………………………………………………..

Thank You for Your Participation

Appendix III: Interview Guide for Librarians

1. Indicate your position in the Library…………………………………

2. For how long have you worked in AKU library…………………………….

3. What type of information resources do clinical and nursing students mostly look for in the libary?

4. Is the information material in the library available and accessible to the students when they need it?

5. a). How frequent did the students ask for help when searching for Information in the library?

6. Which information seeking methods/ strategies do you use to help the students get the information they need?

7. Do you think the information sought by the clinical and nursing students in the library is adequate to meet their information need?

8. Which are the major challenges that students experience when searching for information materials in the library?