Information Needs and Information Seeking Behaviour of Doctors in Kuwait Government Hospitals: An Exploratory Study

by

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Doctoral Thesis

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CERTIFICATE OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this thesis, that the original work is my own except as specified in acknowledgments or in footnotes, and that neither the thesis nor the original work contained therein has been submitted to this or any other institution for a degree.

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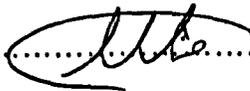
ABSTRACT

In recent years, there has been an increasing demand to study the information needs and information-seeking behaviour of doctors as an essential element in developing successful clinical information systems and improving the quality of healthcare services. This doctoral thesis focuses on exploring the information needs and information seeking behaviour of doctors in Kuwait government hospitals (KGH). The aims are to investigate the internal and external information sources used by doctors in Kuwait government hospitals and to analyse whether the existing clinical information sources meet their needs.

A strategy of sequential, mixed-method procedures was followed to gather the research data using focus groups, a paper-based questionnaire and semi-structured telephone interviews. The participants of the research included all categories of doctors (consultants, senior specialists, specialists, senior registrar, registrar, assistant registrar and trainees), working in four government hospitals: Mubarak Al Kabeer, Al Sabaha, Al Farwania and Al Amiri in Kuwait.

The findings of the study show that the most frequently mentioned need for information was to keep 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.

The results showed some contextual factors either supported or hindered doctors in seeking the information they need. The factors were categorised in the following contexts: a) Organisation context, b) Socio-cultural context; c) Information sources context and d) Scenarios context. Doctors made a number of suggestions for effective information communication and improving the information provision system in KGH. Two conceptual models result from the study findings: a clinical decision-making model scenario and the overall conceptual model of information seeking by doctors in Kuwait government hospitals.

The thesis concludes with recommendations and practical implications to enhance the information provision in KGH. Suggestions for further research are also given.

Keywords: Clinical scenarios, Doctors, Government, Hospitals, Information seeking behaviour, Information needs, Kuwait.

PUBLICATIONS

This research study has been fulfilled as a part of the full-time New Route PhD programme, which was carried out over a period of four years (2005/2006 to 2008/2009). This involves the completion of te n modules ove r three semesters. In addition, various workshops and seminars provided by several departments and institutions such as the Professional Development Department and Sheffield University were attended. All these activities contributed by helping to improve the research student's skills, which has positively impacted on the construction of this thesis.

In addition to the above achievements, the research student has sought to broaden her knowledge in the research subject area and share her study results globally through the following conference presentation:

1. Aldousrai, E.A., Goulding, A. & Harrison, J., 2009. ICT use by doctors in Kuwait public hospitals. *In*: Jordanova, M. & Lievens, F., eds. *Med@Tel: global telemedicine and eHealth updates knowledge resources*. Luxepo: Luxembourg, pp. 45-49. (A copy of the published conference paper is attached in Appendix I)

DEDICATION

I dedicate this thesis first of all to a cherished person whose pride in me gave me the strength to accomplish this work, my Dad, *Abbas Al-dousrai*, whose soul was gone to Allah in the middle of my research journey but whose worthy words and lovely memories have remained and lived in my memory over and over as my research journey has progressed.

My very special dedication goes to my great and wonderful *Mum*. I feel a lucky person to have a Mum like her, without her prayers, love and support the completion of this work would not have been possible.

My most particular and sweet dedication goes to my lovely, bright and quiet *daughter*, whose patience and understanding has helped me to continue this academic journey.

My sincere dedication goes to my *family*, particularly my *sisters and brothers* who have been so proud and pleased to share my dream with me.

ACKNOWLEDGMENT

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APA	American Psychological Association
AR	Assistant Registrar
C	Consultant
CA	Content Analysis
CEL	Clinical Effectiveness Librarian
CIAP	Clinical Information Access Program
CL	Clinical Librarian
CME	Continuing Medical Education
CRUS	Centre for Research on User Studies
DA	Disclosure Analysis
E.N.T	Ear, Nose and Throat
EPR	Electronic Patient Record
ER	Emergency Department
F	Frequently
GPs	General Practitioners
GS	General Surgery
HCIS	Healthcare Information System
HSC	Health Sciences Centre
HSL	Health Sciences Library
ICD10	International Classification of Diseases
ICT	Information and Communication Technology
IM	Internal Medicine
K	Kuwaiti
KCCC	Kuwait Cancer Care Centre
KGH	Kuwait Government Hospital
KIMS	Kuwait Institute for Medical Specialization
KMA	Kuwait Medical Association Library
MCH	Maternal and Child Health
MOH	Ministry of Health
N	Never
NHS	National Health Services
NK	Non-Kuwaiti
Obs. & Gyn.	Obstetrical & Gynaecology
OPD	Outpatient Department
PAAT	The Public Authority for Applied Education and Training
PDA	Personal Digital Assistants
PHCS	Primary Healthcare System
S	Specialist
SCCHMR	Standing Committee for the Coordination of Health and Medical Research
SR	Senior Registrar
SS	Senior Specialist
R	Registrar
UK	United Kingdom

Chapter One

Introduction

1.0 Preamble

One of the most important areas of research in the library and information science field is user studies which first emerged in the late 1940s (Siatri 1999). A range of associated concepts has developed from user studies such as those focusing on information needs, information-seeking and information-seeking behaviours. These studies have attracted many researchers and a large body of literature has developed, particularly following the rapid development in information and communication technology. The medical field is one discipline which has attracted attention in user studies over the years.

Over the past decades, studies of doctors' information needs and information-seeking behaviours have become an important focus of medical field and have been investigated in a variety of contexts, particularly doctors working in primary healthcare services. Few

studies have been conducted to investigate the information needs and information-seeking of doctors working in hospitals. Both primary care doctors and hospital doctors practice medicine and contribute to improving the health of society by providing necessary healthcare services. However, the nature of their duties is quite different. For example, primary care doctors are responsible for defining the diagnosis of the patient and then referring them to secondary care for the appropriate treatment when appropriate. It is then the hospital doctors who continue the journey of the primary care doctors by referring those patients requiring further medical expertise or procedures for either medical care or a secondary diagnosis (Simpson *et al.* 2009a). Besides that, hospital doctors have other duties involving many clinical scenarios. For instance, when they work in the outpatients department they usually see patients who have been referred from primary care or the emergency department and need further diagnosis and treatment. They see inpatients that come to hospital for treatment and diagnosis and who have to stay overnight. In addition, they see emergency patients who need immediate attention for diagnosis and treatment of injuries or illness. Moreover, they may choose to treat patients or refer them to another specialist, consultant or healthcare professional. They work collaboratively with a wide range of other professionals across the healthcare sector. Thus, it seems that doctors are working in a full, rich, contextual environment and, as in any other profession, they need information in their daily practice.

Thus, Hersch and Lunin (1995) mentioned that about a third of doctors' time is spent recording and synthesising information and a hospital spends a third of its costs on personal and professional communication. Doctors' information needs will be expressed by seeking different types of information sources to fulfil them. Normally, doctors rely on their personal medical knowledge. Thompson (1997) stated that doctors normally rely on their personal knowledge that builds up over years of clinical practice. Also, they rely

on information that is available in patient medical files or via communication with the patients such as explanation of symptoms and requests for further investigations such as laboratory tests and X-rays. All these sources of information exist to help the doctor reach his/her conclusion. The doctor may ask questions in order to enable his/her medical decision-making to provide better services to patients and eventually improve healthcare.

Despite the doctors' medical knowledge and patient data resources being the primary information resources that assist doctors in their clinical judgment, they may not be able to satisfy doctors' information needs if they are not updated or use other information sources to add to their medical knowledge (González-González *et al.* 2007). The introduction of information and communication technology, such as the Internet, under the term 'eHealth' (Hill and Powell 2009), has the potential to improve health information provision by providing access to a large body of online clinical information and knowledge. In addition, the computer-based patient record is another feature of the advance of eHealth technology. It is designed to support healthcare providers through the availability of complete and accurate patient and medical data and a clinical decision-support system. In spite of the several advantages of using these technologies, they increase the amount of clinical information, which may create other problems, as doctors have to access and manage the information they need. Another issue is that new technology may fail to live up to expectations. One of the reasons for the unsuccessful implementation of health information systems as indicated in the literature is the lack of knowledge about the end users' information needs (Ely *et al.* 2005). Certainly, doctors' information needs and information-seeking is different from one scenario to another. Their information needs occur in different clinical scenarios and the most common scenario indicated in the literature was communication with patients in outpatient

departments, wards and emergency rooms. Thus, the degree of using the above-mentioned clinical information sources will be crucial in doctors' clinical decision-making in these three scenarios. This study explores these issues within a Kuwait context.

1.1 Statement of the problem

The state of Kuwait is a small, wealthy country, located in the Middle East region, bordering the Persian Gulf, between Iraq and Saudi Arabia (El-Sayed 2006). The government in Kuwait has started in recent years to join the Information Age through government work programmes (Ministry of Planning 2000) and plans to adapt to current developments in information technologies. Today, Kuwait is the third largest information technologies market in the Gulf region, after Saudi Arabia and the U.A.E. (Business Monitor International 2009). Healthcare services occupy an important and significant position amongst the decisions made by the government. Health authorities are seeking for an optimal way to utilize and manage the patient medical data to enable healthcare providers to improve the quality of healthcare in Kuwait. One of the major developments in recent years has been the implementation of a healthcare database, the Primary Healthcare System, in all primary healthcare centres in Kuwait. Also, a Secondary Healthcare System for regional hospitals, which is undergoing development, involves the creation of a Hospital Management Information System (United Nations 2007). Because doctors working in public hospitals are a fundamental part of the Kuwait healthcare delivery system, their information needs and seeking is crucial in improving the current healthcare information provision. Consequently, this study aims to play a part in these government attempts to improve the situation.

Understanding information users' needs and the way information flows through an organization is essential in developing a successful system and improving the quality of services in any organization or society. Therefore, studying the information needs and information-seeking behaviours of doctors in different contexts is a key step in identifying doctors' perceptions of their need for information for good clinical decision-making and developing a successful information provision system that would help doctors' practices.

1.2 Purpose of the study

There is an increasing focus on improving clinical information provision in the medical area. There is no doubt that information and communication technologies have revolutionized the methods of healthcare delivery by facilitating the access, storage and dissemination of clinical information over great geographic distances. The healthcare authorities in Kuwait are making an effort to adapt to rapid information technological development. In the previous section, some of the information technology applications in the Kuwait healthcare delivery system were indicated. However, these applications have experienced several problems (Shah, Shah and Behbehani 1996, Shah 1998 and Abdelhadi 2000). Studies have been conducted to investigate the reasons for these failures in the public sector. The research study conducted by Al-Hajerri (2005) concluded that the following factors had negatively impacted on the successful implementation of the Health Information System in the public sector: lack of end-user involvement; insufficient planning; lack of training; few incentives and uncertainty of benefits.

It was clear that there the Ministry of Health (MOH) in Kuwait was greatly concerned about utilizing information technology to improve the accessibility of patient data, however, a critical issue has been raised concerning the lower level of concern for attempting to improve the accessibility of knowledge resources in the healthcare delivery system. A number of studies carried out by researchers in Kuwait have revealed a range of problems and difficulties faced by Kuwait Health Sciences Libraries. Al-Ansari and Al-Enezi (2001) conducted a wide-ranging study to examine the status of seventeen health sciences libraries in Kuwait in terms of their staff, collections, facilities, use of information technology, information services and cooperation. The results showed that the majority of health sciences libraries, particularly in academic institutions (Health Sciences Library in Kuwait University, the College of Medical Science Library (women) at The Public Authority for Applied Education and Training (PAAT)), and the Central Medical Library in KIMS, had large collections. However, small collections were also found in the hospital libraries such as the Military Hospital Library, the Al-Razi Hospital Library and the Psychological Hospital Library. Also they indicated that the majority of library staff are non-professional and that they provide only basic information services. Cooperation among libraries is also limited. The survey results also point out that a significant number of health sciences libraries are not automated. Also, other studies investigated the obstacles that hinder doctors in using the electronic resources in the HSL in Kuwait University. A study conducted by Ur Rehman and Ramzy (2004a) showed a low use of electronic resources by medical doctors in the Health Sciences Library (HSL) in Kuwait University. The reasons for the low use were reported as time constraints, lack of knowledge and skills for accessing and using available resources and the capacity to reach a librarian at the time of need. A large number of medical doctors proposed a variety of measures, such as formal orientation and training, to become more effective. Another study was conducted by Ur Rehman

and Ramzy (2004b) to analyse Internet use and related issues among healthcare professionals at the HSL of Kuwait University. The results indicated that the Internet had become an essential tool in doctors' lives which they used for different purposes such as searching for information for research, teaching and continuing professional development and communication with each other by emails and in chat rooms. However, respondents to the study wanted more training in accessing and searching for relevant information, also they needed a high-speed response system to save them time.

All the studies mentioned above confirmed the importance of health sciences libraries in healthcare. In addition, they recommended solutions useful for upgrading the libraries' services. Several studies have shown the importance of these sources of information for doctors' medical practice (Ali 2000, Casebeer *et al.* 2002 and Bernstein 2007). In Kuwait, there is always a gap between identifying information needs and satisfying them (Ministry of Planning 2000). Thus, solving the problems that inhibit the vital role of clinical information provision such as the Healthcare Information System (HCIS) and hospital libraries, through understanding doctors information needs and seeking will open up a new era for healthcare providers. Hence, the first purpose of this study is to investigate doctors' perceptions and needs in using the different information sources, such as HCIS and hospital libraries.

Researchers in information needs and information-seeking have investigated the issue in different contexts and indicated that there are multiple factors influencing information-seeking activities, such as the type of information sources and the methods to access information (Boyd 2004). In another view, researchers in Health Informatics explored the issue from the system perspective through examining the different domains that affect clinical decision-making. Indeed, the clinical decision-making is driven from

different clinical information sources. Thus the second purpose of the mixed method study reported here is to focus on exploring the information needs and information-seeking of doctors by bringing together the two views. Thus, the study will explore the doctors' information-seeking in the context of three scenarios (outpatients departments, wards and emergency rooms) and look to the degree of use of the different types of information sources which exist and are sought for clinical decision-making in Kuwait government hospitals (KGH). Furthermore, the purpose of the study is also to identify any contextual factors hindering doctors in obtaining the information they need at Kuwait Government Hospitals. Data will be collected for the study describing two conceptual models of doctors' information needs and the seeking process in KGH. Finally, this research seeks to recommend strategies and practical solutions for the improvement of the information provision system within Kuwait government hospitals.

Thus, exploring the information needs and seeking of doctors in Kuwait government hospitals is worthy of scholarly research, since Kuwait appears to lack studies that have examined such information problems (Ministry of Planning 2000).

1.3 Significance of the study

This research fills a gap within the existing literature. A review of the related literature found that primary care doctors' information-seeking is context-oriented according to a large number of studies (Gorman and Helfand 1995, Nylenna and Aasland 2000, Gorman 2001, Bryant 2004, Dorsey and Detlefsen 2005 and Coumou and Mejman 2006) and only a few studies focus on the information needs and information-seeking behaviours of doctors working in hospitals (e.g. Ocheibi and Buba 2003, Tan *et*

*al.*2006). Cheng (2004) indicated that the literature showed that the most common study populations were general practitioners and family doctors working in primary care settings and that very few investigations had been carried out in the hospital setting.

In addition, a review of the related literature found that most studies conducted to investigate information needs and information-seeking behaviours emphasised only one scenario, for example doctors' information needs in the emergency room (Lappa 2005). Also, no studies have been found which compare different scenarios i.e. the information needs and information-seeking of doctors working in outpatients, wards and emergency rooms. There have been no studies investigating the information needs and information-seeking of doctors for medical practice in these three scenarios in Kuwait Government Hospitals. This suggests that there is a need for such a study to investigating information needs and seeking in different contexts, which would consequently enrich the literature with more new findings. Also, as mentioned, this is the first study to be undertaken on this subject in Kuwait and may provide guidance and insight for other countries, particularly Gulf countries.

Another gap indicated from the literature review is that there is a great focus on studying the information-seeking of doctors in obtaining information from knowledge resources. However, the patient data resources were not investigated in most studies, although, the few studies that do focus on these suggest that doctors' knowledge and experiences and patient data were the most frequent information sources used by doctors for their medical practice (Thompson 1997, Gorman 1995, Laerum, Ellingsen and Faxvaag 2001). While 'decision-making' considers concepts closely related to information-seeking behaviour (Case 2007) there is a lack of literature concerning the clinical decision-making element in doctors' information-seeking processes. Donohew and

Tipton (1973, p.251) stated that "much information-seeking research is intertwined with decision making". The most common themes found in the literature were related to studying information needs and seeking by determining the clinical questions generated by doctors through communicating with patients or searching for online information (Covell, Uman and Manning 1985, Green, Ciampi and Ellis 2000, Seol *et al.* 2004 and Magrbi *et al.* 2005). On the other hand, clinical decision-making was the factor highlighted the most in developing a successful healthcare information system (Bauchner, Simpson and Chessare 2001, Clauson *et al.* 2007 and Sittig *et al.* 2008). Thus, investigating the extent of three information domains: doctors' knowledge and experiences, patient data and knowledge resources for clinical decision-making, in three clinical scenarios will be worthwhile for the future development of a successful health information system and also the provision of good healthcare services and sound clinical decision-making.

The findings of the study explore the different types of information sources available in Kuwait government hospitals and will also provide evidence of the extent to which these information sources are used by doctors. This study also supports recommendations for further research into the information-seeking behaviour of healthcare professionals in Kuwait made by previous studies (Al-Ansari and Al-Enezi 2001, Ur Rehman and Ramzy 2004a). The results of this study should provide a more comprehensive basis for the further planning and development of information sources and services in Kuwait healthcare. Lastly, the findings of this study will propose conceptual models of integrated information provision which will help in improving the existing information provision system in Kuwait and it will provide guidelines for other hospitals in which such a system does not exist. Thus, it is necessary to understand the information needs and information-seeking behaviour of doctors in Kuwait government hospitals.

1.4 Definition of terms

To avoid confusion, it is important for the reader to be familiar with the terminology used in this research study. For the purpose of this study, the following terms will be used:

Doctor

A person qualified to practise medicine (Simpson et al. 2009a). Doctors work in three healthcare levels: primary (e.g. family health centres, poly clinics, General Practitioners etc.), secondary (e.g. general hospitals) and tertiary (specialist hospitals). This study focuses on doctors working in secondary care who can be identified as clinicians working in hospital (Nylenna and Aasland 2000, p.9). Almost all hospital doctors specialize in a particular area of medicine or surgery, such as: anaesthetics, cardiology, ophthalmology, paediatrics or pathology.

Hospital

An institution providing medical and surgical treatment and nursing care for sick or injured people" (Simpson et al. 2009b).

Clinical area scenarios

Doctors need information and seek information for making clinical decisions in different situations such as when they see the patient in outpatients, in the hospital wards and/or in the emergency rooms.

Information need

This can be defined as "a recognition that your knowledge is inadequate to satisfy a goal that you have" (Case 2007, p.5).

Information- seeking behaviour

This is "purposive seeking for information as a consequence of a need to satisfy some goal. Individuals interact with two paths when seeking for information: manual information systems e.g. newspaper or a library and computer-based systems such as WWW" (Wilson 2000a, p.49). For the purpose of this research, the definition will be extended by adding 'also in response to reducing uncertainty in doctors' clinical decision-making'. Also, it refers to doctors' methods of seeking different channels such as interpersonal communication.

Health information

Data and knowledge used and communicated by intelligent systems (human and artificial) to support the decisions (of health practitioners) (Wyatt and Sullivan 2005, p.566).

Clinical decision-making

Clinical judgments made by doctors to decide specific aspects of care such as diagnosis, choice of tests, prescription of drugs, surgery and therapy.

Medical practice

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

Patient data

Patient data, including information about individuals (e.g. patient's history, observation from physical examination and results of diagnostic) taken from the patients, patients' family, friends and medical records (Gorman 1995).

Knowledge support-resources

This refers to general information about patient care usually obtained from generalized research and practice, from journals and textbooks.

1.5 Research questions

There are three key research questions that have been framed to explore this research problem. Each central question has a number of associated sub-questions. They are:

Q1 What are the information needs of doctors?

- What sort of information do doctors need for their medical practice?
- What are the reasons for the information needs that apply to doctors working in medical practice?
- Are there any differences in the information needs of doctors with different working experiences? If so, what are they?

Q2 How do doctors seek information?

- How do doctors obtain the information they need for their medical practice from different sources?
- Do doctors seek other information sources outside their hospital for medical practice?
- How do doctors seek the different information sources in three clinical area scenarios (outpatient, wards and emergency rooms)?
- What criteria are used by doctors in choosing clinical information for medical practice?
- Do doctors face any barriers or difficulties in obtaining the information they need inside Kuwait government hospitals? If so, what are they?

Q3 What are the internal and external information sources used by doctors?

- What different types of information sources are available in Kuwait government hospitals and used by doctors?

- What other external sources that are not available in their hospitals, do doctors use?

- Are doctors satisfied with current information sources and information provision inside Kuwait government hospitals?

- Do existing information sources and information provision services need improvement? If so, how?

1.6 The research aims and objectives

1.6.1 Aims

The main aims of this study are:

Aim 1: To explore the information needs and information-seeking of doctors in Kuwait government hospitals.

Aim 2: To investigate the internal and external information sources used by doctors in Kuwait government hospitals.

Aim 3: To analyse whether the existing clinical information sources meet the needs of doctors.

1.6.2 Objectives

The specific objectives of the study are:

Objective 1: To identify the reasons for the information needs of doctors in Kuwait government hospitals (Aims 1 and 2).

Objective 2: To determine the type of information doctors need for their medical practice (Aims 1 and 2).

Objective 3: To identify the various existing types of information sources that are used by doctors in Kuwait government hospitals (Aims 1 and 2).

Objective 4: To identify other information sources doctors seek outside their hospitals and use for medical practice (Aims 1 and 2).

Objective 5: To investigate how doctors obtain and access the required information for their clinical decision-making in three different clinical area scenarios: outpatient departments, wards and emergency rooms (Aim 1 and 2).

Objective 6: To examine the degree of use of a range of information sources by doctors in the three different clinical area scenarios (outpatient departments, wards and emergency rooms) in Kuwait Government hospitals (Aims 1 and 2).

Objective 7: To identify the criteria doctors use in deciding which type of clinical information to use for medical practice (Aim 2).

Objective 8: To examine whether the existing sources of information meet the needs of doctors in Kuwait government hospitals (Aim 3).

Objective 9: To identify any barriers doctors encounter in accessing and acquiring information for medical practice in Kuwait Government hospitals (Aim 3).

Objective 10: To identify doctors' suggestions and opinions for improving the current information provision (Aim 3).

Objective 11: To develop conceptual models for information provision to incorporate the expressed information needs of doctors in Kuwait government hospitals (Aims 1, 2 and 3).

1.7 Delimitations of the study

This exploratory study investigates the information needs and information-seeking of doctors in Kuwait government hospitals. The first and most significant delimitation that

the researcher places on the study is that the researcher will narrow the scope of the research to information needs and seeking behaviour of doctors rather than other healthcare providers such as nurses and allied health professions. The second delimitation that the researcher will place on the study is that the researcher will choose only the secondary care setting hospitals in Kuwait government sector. Also, the researcher will choose a range of different job titles of doctors, such as consultants, senior specialists, specialists, senior registrar, registrar, assistant registrar and trainees. Medical students, psychiatrists and dentist will exclude from the study. Finally, the study will focus on the information needs of medical doctors for making clinical decision through only three scenarios including outpatients, wards and emergency rooms. The rationale behind the selection of the population is explained in chapter four.

1.8 Organisation of the study

This research study is presented in nine chapters as shown in Figure 1.1. *Chapter one* includes the general introduction to the research context, the purpose of the study, the significance of the study and a definition of terms. It also identifies the research questions, aims, objectives and delimitations.

Chapter Two provides background about the state of Kuwait, its general characteristics and the healthcare delivery systems. It also provides the reader with an overview of the hospitals selected for this study.

Chapter Three presents a review of the literature relevant to the information needs and information-seeking of doctors in context. It identifies the range of information sources used by doctors and the contextual problems doctors meet in obtaining the information they need.
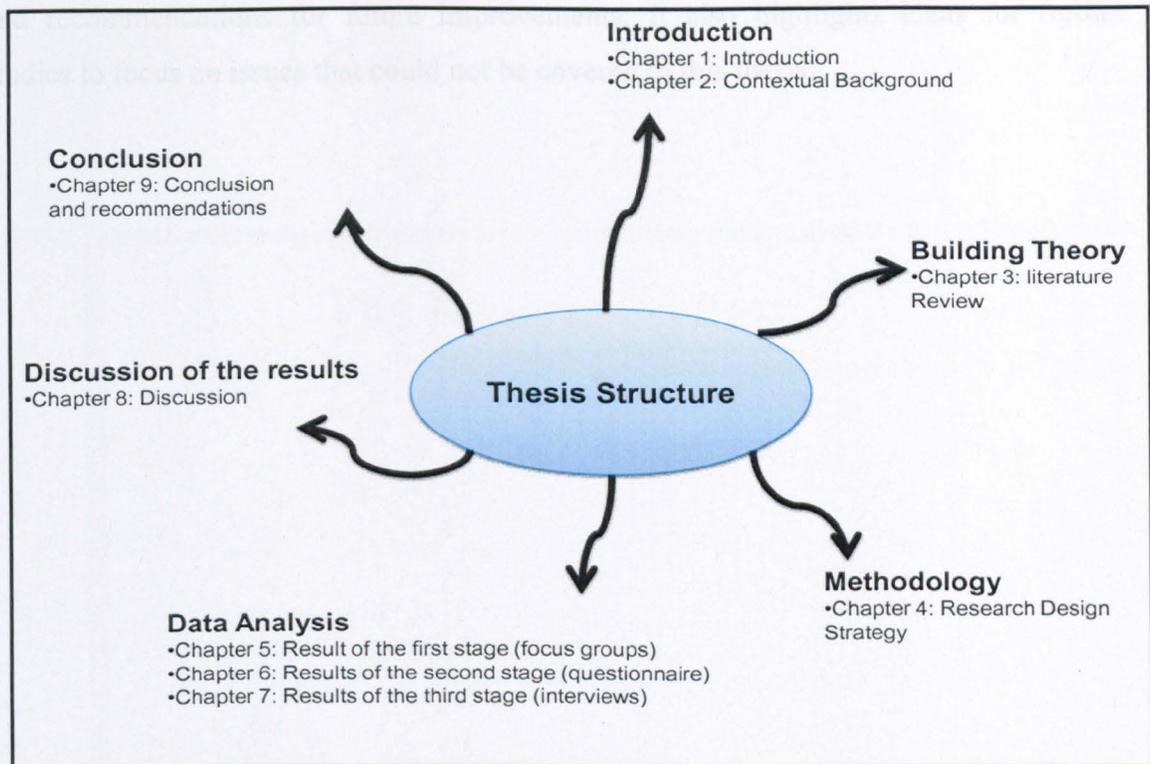
Figure 1.1: Thesis Layout

Chapter Four presents the research design in detail including the philosophy; the approach to the inquiry data collection techniques, data analysis and the limitations that arise from the methodology and data.

Chapter Five details the first qualitative results using focus groups.

Chapter Six presents the quantitative analysis results of the second stage of data collection using questionnaires.

Chapter Seven presents the qualitative data of the third stage using telephone-administered, semi-structured interviews.

Chapter Eight draws together the threads of the argument by presenting the integration of the results from the three data collection stages - focus groups, questionnaire and telephone interviews - in the light of the reviewed literature and the research aims and objectives.

Chapter Nine presents the conclusion of the thesis through an examination of whether the aims and objectives have been achieved. It sets out some implications for practice

and recommendations for future improvements. It also highlights ideas for further studies to focus on issues that could not be covered in this thesis.

Chapter Two

The Kuwait Context

2.0 Introduction

This chapter is divided into four sections. The first section provides a description of different aspects of Kuwait as a state, such as geographical location, economic issues and education. The second section presents an overview of healthcare delivery services in Kuwait past and present. Section three explains the information services and information provision in the Kuwait Ministry of Health. The last section provides brief information about the selected study hospitals followed by a summary of the main points of the issues involved.

2.1 The State of Kuwait: background and characteristics

2.1.1 Geography

The state of Kuwait is a Middle Eastern country, situated at the northern tip of the Persian Gulf between Iraq and Saudi Arabia (see Figure 2.1) (Peck 2004). The total area is about 6,877 square miles (17,820 square kilometres) (Wilks 2006). Kuwait has hot and dry weather in the summer, which starts in April and ends in September. In the remaining times of the year, the temperature is moderate and, infrequently, the temperature in winter may drop down below freezing (Peck 2004).

Figure 2.1: A map of the State of Kuwait

The capital of Kuwait is Kuwait City, located in the centre of Kuwait and on the shoreline of the Persian Gulf. The state of Kuwait is divided into six governorates: Al Ahmadi, Al Farwania, Al Asimah, Al Jahra, Hawalli and Mubarak Al Kabeer. Each governorate is subdivided into districts.

2.1.2 Demographics

The population of Kuwait in 2006 was 3,051,845. Of this 1,008,090 (33%) were Kuwaitis and 2,043,755 were Non-Kuwaitis (67%) (El-Sayed 2006). Arabic is the official language spoken in Kuwait but English is widely spoken. Islam is the official religion of Kuwait, 85% of the population is Muslim and 15% of its citizens are Protestant or Catholic Christians, Hindu, Parsi and other religions (Wilks 2006).

2.1.3 Economy

Kuwait has a small and rich economy. Oil is the most important economic resource in Kuwait, which has 10% of all of the oil reserves in the world. Prior to the discovery of oil, the economy of the country was based on three main resources: fishing, agriculture, and trade. The discovery of oil in Kuwait occurred in the 1930s. After Kuwait gained independence from the United Kingdom in 1961, the innovation of oil made Kuwait one of the wealthiest countries in the world (Peck 2004). At present, Kuwait exports 90% of its crude oil and refined products to Asia and the Western European markets whilst importing finished products, such as appliances and vehicles, from industrialized nations, particularly Japan, the United States, the United Kingdom and Western Europe (Peck 2004).

2.1.4 Government in Kuwait.

The State of Kuwait is a constitutional monarchy (Khoury 2006). Individual freedom is guaranteed for all Kuwaitis. Their rights are protected by the constitution such as "personal liberty, freedom to hold beliefs and express opinions, freedom to form associations and trade unions, freedom of the press. The torture and deportation of Kuwaiti citizens are prohibited" (Khoury 2006, p.74). The constitution outlines the structure of the Kuwaiti political system, which is organized into four major institutions:

- The Head of the State (the office of the Amir).
- The Legislature (the National Assembly).
- The Executive Branch (the cabinet and administrative departments).
- The Judiciary.

Executive authority is vested in the Amir (Prince). It is exercised by the Cabinet of Ministers, which is chaired by the Crown. Legislative authority is vested jointly in the Amir and the National Assembly of fifty members, who are elected through a direct secret ballot (Khalaf 1984). The right to vote is accorded to Kuwaiti males who are 21 years or older. On May 16, 2005, the government allowed women in Kuwait the right to vote and stand in elections. New Zealand was the first country to allow women to vote in 1893. British women voted in 1918 and American women followed in 1920. The first Arab women to vote were in Palestine in 1946 (Binyon 2005).

2.1.5 Education

Education in Kuwait is the cornerstone of development and progress of the state. The government is working hard to provide the best of modern means of learning and

education for the society. The education system is linked to the prevailing economic and social conditions. In the pre-oil period, the education system was limited to the teaching and reciting of the Holy Quran and arithmetic. Brisk trading and economic activity, however, changed all this and led to the establishment of the first school in 1911, the Al-Mubarkiya School, followed by the establishment of the Al-Ahmadiya School in 1921.

In 1936, Kuwaiti merchants established the Education Council and expanded the system to include four new primary schools, including one for girls. The government soon took over this growing system and, with new oil revenues after World War II, rapidly expanded the system. In 1956, the government implemented a major education plan that divided formal education into four levels; kindergarten, primary, intermediate, and secondary (Al-Sahel 2005 and Al-Ajmi 2009a).

Kuwait University is "Kuwait's principal institution of higher education" (Peck 2004, p.1353). It was established in October 1966 with Colleges of Science, Arts and Education, and a Women's college. At present, Kuwait University offers wide-ranging programmes in sciences and humanities at the undergraduate, graduate and doctoral levels through its 13 colleges (Al-Ajmi 2009b). In addition, private universities have opened recently, such as The American University of Kuwait, the Arab Open University, the Gulf University for Science and Technology and the Australian University.

The Public Authority for Applied Education and Training (PAAET) is responsible for providing state-funded adult education and vocational training. It has four colleges including the Colleges of Basic Education; Business Studies; Health Science and Technological Studies. Also there are seven institutes in PAAET specialising in Electricity and Water; Telecommunication and Navigation; Industrial Training; Nursing;

Constructional Training and Vocational Training (Al-Ajmi 2009c). In addition, there are several private institutions in the country that offer a variety of full and part-time courses in various subjects such as business studies, secretarial skills, computing and languages.

2.2 Healthcare in Kuwait

2.2.1 A brief history of health services

Healthcare is viewed in Kuwait as a keystone for building healthy and strong individuals and societies. The Kuwaiti Government supports health services and provides free treatment for Kuwaiti nationals. However, non-nationals are charged low fees. The history of the healthcare service in Kuwait dates back to the early 1900s. It can be broken down into the following five distinct phases:

Prior to 1912, the health needs of the Kuwaiti population were met by Arabic and traditional medicine, in which herbs were primarily used for healing. Considerable experience and substantial knowledge were gained during this era. In times to come, the Centre for Islamic Medicine at the Sabah Health Region would benefit from that experience, which may relate to the overall system as well as to the research component in particular (Naim *et al.* 1986).

1913-1948, the American Mission set up the first clinic in Kuwait, named "The American Hospital", in 1914 to provide primary healthcare services (see Figure 2.2). Later, in 1917, the first government clinic for women was established (Al-Jarallah 1996). In addition, one of the important occurrences at that period was the construction

of the Department of Health in 1936. The department was responsible for curative services such as providing health services and vaccination against some diseases (Naim *et al.* 1986).

Figure 2.2: A picture of the old American hospital in Kuwait

1949-1960 was the period of growth and expansion for the health services in Kuwait. The first hospital, the old Amiri was established in 1949 to be the keystone in the foundation of the healthcare delivery system in Kuwait. In addition a number of clinics were established in that period to meet the health needs of the population in different areas. By 1960 there were 16 clinics in the state of Kuwait. The first Maternal and Child Health (MCH) centre was opened in 1955 (Naim *et al.* 1986).

1961-1974, the state of Kuwait entered a new era when it gained independence in 1961. In the same year, the Ministry of Public Health was set up and a number of additions to the health facilities and to the health systems occurred with the establishment of the Ministry of Public Health. At that time, the Ministry of Health consisted of two major

departments in addition to administrative and support services: the department of curative medicine and the department of preventive medicine. Another two significant later developments were the establishment of the old Maternity hospital in 1961 and the Sabah hospital 1962.

1975 to the present, the number of hospitals increased to 11 in 1980 and a number of clinics and centres were established. This expansion required major organisational changes and led to a new era.

2.2.2 The structure of the healthcare delivery system today

Today the Ministry of Public Health, which is located in the Capital region, is responsible for planning, financing, resource allocation, regulation, monitoring and evaluation as well as healthcare service delivery. It controls the public and private health sectors in Kuwait in terms of norms, performance standards, operations and particularly the manpower components and qualifications. Organizationally, the Ministry of Public Health is headed by the Minister for Public Health, who is assisted by the Undersecretary and 13 Assistant Undersecretaries for Technical Affairs, Administrative Affairs, Financial Affairs, Pharmaceutics and Medical Appliances, and General Services (organization chart of the structure of MOH is in Appendix II).

Healthcare services are primarily organized on the basis of population density and distribution. The MOH identified six health regions: Al Sabah, Capital, Al Farwaniyah, Al Jahra, Hawali and Al Ahmadi. The health region is considered a nearly independent, decentralized, administrative unit. Each region is headed by a regional director, who

reports to the Undersecretary of Health. The health regions provide for the comprehensive health needs of a population of 250,000 to 300,000 (El-Sayed 2006). The service delivery system (see Figure 2.3: Kuwait Healthcare Delivery System) in each region is provided through a system of three levels of healthcare as discussed below:

Primary Healthcare: Primary Healthcare, or the first level of care, is provided at health centres. Health centres provide curative, preventive and rehabilitative services. The services offered include general practitioner services, maternal and child health services, family medicine, diabetes patient care, dental services, preventive medical care, nursing care and pharmaceuticals. Simple laboratory tests and X-rays are carried out at some of the centres. The centres refer patients to specialized clinics and hospitals. Furthermore, they provide services to psychiatric patients at their homes, and social and rehabilitative care for needy individuals and families. There were 78 primary healthcare clinics and 38 diabetic clinics in 2006 (El-Sayed 2006).

Secondary Healthcare: Secondary healthcare is provided through the six general hospitals: Al-Sabah hospital, Al-Amiri hospital, Al-Adan hospital, Al-Farwaniya hospital, Mubarak Al-Kabeer hospital and Al-Jahra hospital. Each hospital provides internal medicine, general surgery, paediatrics and orthopaedic services. However, some hospitals also provide ophthalmology, psychiatric services, dermatology, physical medicine and dental services (El-Sayed 2006).
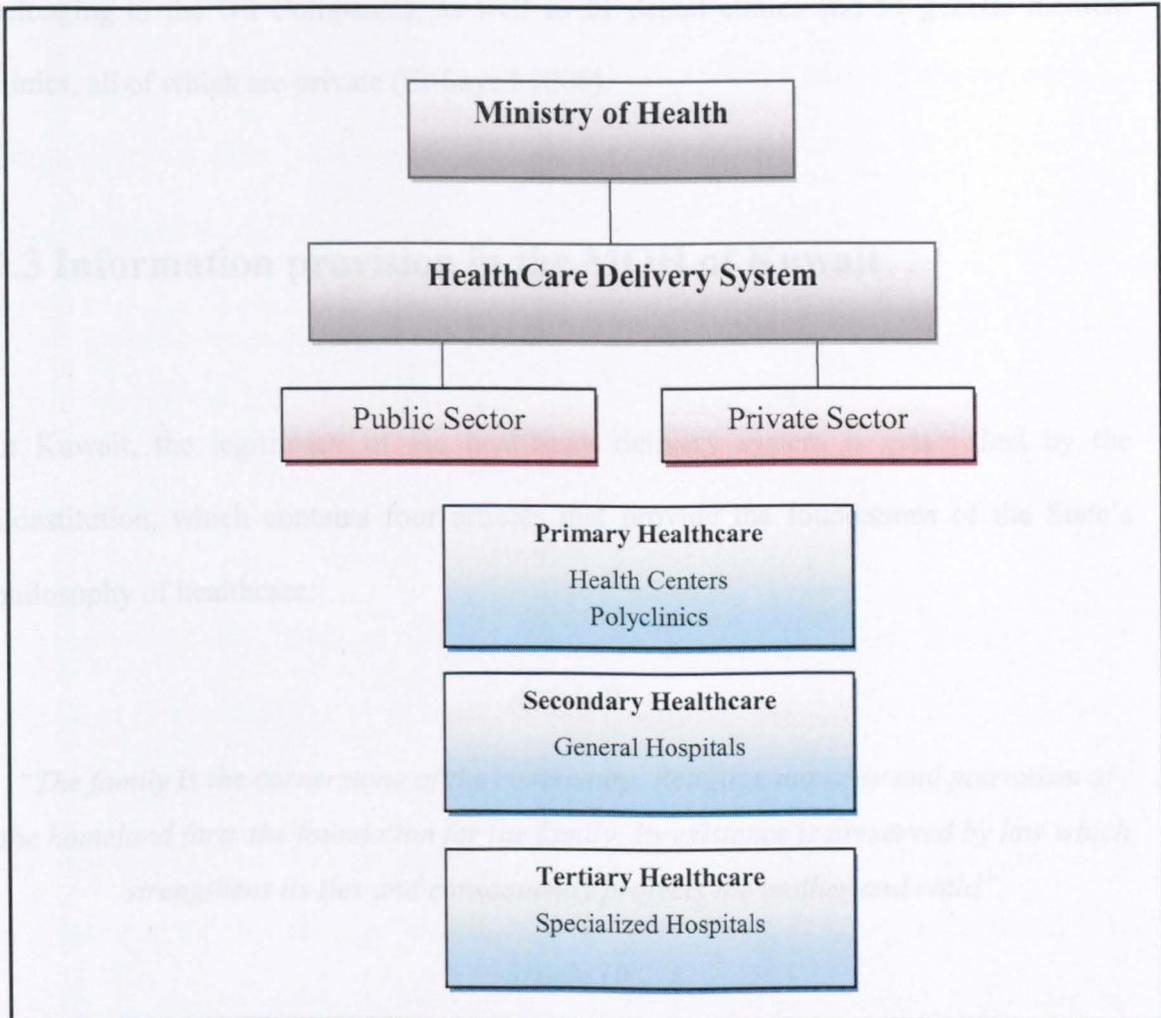
Figure 2.3: Kuwait Healthcare Delivery System

Tertiary Care: Tertiary, or third level, care is provided by nine specialized hospitals such as the Maternity Hospital, the Hospital for Psychiatric Medicine, the Chest Diseases Hospital, the Ibn Sina hospital for neurosurgery; the Razi hospital for orthopaedics, the Kuwait Centre for Allergies, the Kuwait Cancer Control Centre, and the Sulabikhat hospital for physiotherapy and rehabilitation (El-Sayed 2006).

Private Sector and Oil Company Hospitals: Healthcare in Kuwait is also provided by private sector healthcare services. They provide curative services and have little role in preventive interventions. There are five private sector hospitals and three hospitals

belonging to the Oil Companies, as well as 21 dental clinics and 51 general medical clinics, all of which are private (El-Sayed 2006).

2.3 Information provision in the MOH of Kuwait

In Kuwait, the legitimacy of the healthcare delivery system is established by the Constitution, which contains four articles that provide the foundations of the State's philosophy of healthcare:

Article 9

"The family is the cornerstone of the community. Religion, morality and patriotism of the homeland form the foundation for the family. Its existence is preserved by law which strengthens its ties and consequently protects the mother and child".

Article 10

"The state provides care to youth and protects them from exploitation and from moral, physical and spiritual neglect".

Article 11

"The state ensures aid to citizens in old age, illness or inability to work and provides them with services of social security and healthcare".

Article 15

"The state is responsible for public health and the means of prevention and treatment of diseases and epidemics" (Naim et al. 1986).

A careful review of these four articles reveals that the state of Kuwait's philosophy governing the healthcare delivery system is all-encompassing and comprehensive. In other words, it is not restricted to the usual preventive and curative services only. It goes

far beyond them by making the state responsible for the social, moral and ethical development of its population and for ensuring that the special needs of the various sub-groups of the population are met.

Thus, the broad aims of the Ministry of Health are:

- To maintain and promote the health of the population;
- To improve physical, mental and social well-being; and
- To reduce morbidity, disability and mortality as far as possible (Naim *et al.* 1986).

Operationally, these broad aims have been divided into objectives that correspond to the spheres of environmental safety; health promotion; disease prevention and control; early diagnosis and treatment; rehabilitation; provision of adequate healthcare services; systems development and the construction and maintenance of buildings. The MOH believes that the provision of information in the right place at the right time is the primary key for achieving its objectives. It pays attention to providing users with the information they need. There is no clear, written, information strategy that explains the flow of information in the Kuwait healthcare delivery system (primary, secondary and tertiary), but there are some applications and activities that demonstrate how the Ministry of Health is attempting to establish a good information provision system. These are explained in the next section.

2.3.1 Application of ICT

The new strategy of the Kuwait government is to seek to make progress in the information age by utilizing Information and Communication Technology in all ministries, organizations and institutions in both the public and private sectors. One of

the major ICT applications in Kuwait was introducing the Internet into education. For example, Kuwait University was the first learning institution in the Arab world to offer full Internet access to its students in 1992, when the Internet was introduced in Kuwait. Kuwait University has five main campuses and the installation of a converged network provides distance learning. The digital library provides students with a video-on-demand facility where all the live lectures are recorded and backed up to an online library, including a portal to register for academic courses and receive information through the Internet (United Nations 2007).

Indeed, the Ministry of Health has also been involved in this technology development. The planner in the Ministry of Public Health developed a plan for the automation of workflow in all healthcare delivery systems. IT was also used to facilitate the flow of health information between all national and international health networks. The MOH is thus attempting to introduce the latest information technology to improve the performance of healthcare professionals and to provide better healthcare to the public and expatriates as desired by the state of Kuwait. The following are some of the ICT implementations in Kuwait healthcare that aim to fully automate national healthcare delivery and management through a centralized database and Internet-based network;

- *Implement the Primary Healthcare System (PHCS):* the Department of Information in the MOH developed the PHCS and installed it in all primary healthcare centres in Kuwait. The ministries made sure that all users such as doctors, pharmacists, nurses and medical record staff received the appropriate training on the system. The PHCS system is an integrated solution which helps maintain the patients' electronic medical records and acts as a repository for the Decision Support System. The application handles the entire lifecycle of a

patient's visit to primary care clinics. A patient's past medical history can be obtained from the central repository from any of the 80 clinics the patients can visit. An additional system for Diabetic Care and Maternity (Gynaecology and Obstetrics) has been implemented in specialized clinics.

- *Develop the secondary Healthcare Information System (HCIS).* This is still undergoing development. This is a medical information system for hospitals with the purpose of creating an electronic file for each patient. It contains all the medical analyses, patient history, doctors' and nurses' notes and information on the physical condition of the patient and investigations (e.g. lab results, X-ray reports etc.). The software operates within a computer network in such a way that all the hospital departments are connected together as a single unit in one place to decrease the time, effort and cost for the patient, so that all hospital departments are sharing the same information to relieve the patient of routine. The patient file will be stored in case of another visit. In addition, each regional hospital along with those of all health centres in the same regions will have its own database. Also, the system will make use of the communications links that connect the health centres with their regional general hospitals.

- *Apply the Birth and Death Registration System*: this has been developed as a web application to register all births and deaths in Kuwait. This system can provide statistical reports.

- *The MOH Website:* this provides a valuable insight into the Ministry and provides details of all the departments and sections. Through the web application, individuals can submit the various registration forms required by different departments like the medical licensing departments and purchasing

departments. The website is being developed to address all the business transactions of the MOH through this site in future.

2.3.2 Medical Records and Statistics Department

The Department of Medical Records and Statistics in Kuwait is one of the vital sources of information for the entire healthcare delivery system. It is responsible for obtaining and providing medical records to authorized healthcare providers. The main functions of the patient record are related to the collection of data such as patients' medical problems, diagnoses, treatments and other important patient information, including follow-up data and quality measures. The Department of Medical Records also has other duties such as to keep and maintain accurate patient records by reading, analyzing and reviewing medical records of inpatients. It also determines and codes the principle and secondary diagnoses, treatment and procedures by using international standardized coding system (ICD10) (Health & Vital Statistics Division 2005).

The patient medical record is an important document for patients, doctors and hospitals. For instance, the paper patient medical record provides doctors with all patient data to help him/her to follow the patient's progress. Also, a patient's medical record helps to estimate the volume of work carried out by a doctor at the hospital within a specified time period. For example, the patient medical record demonstrates information on the number of patients admitted to hospital under a particular doctor's supervision; shows the number of consultations made by the doctor and provides the number of surgical operations conducted by him/her. Another advantage of using the patient's medical record is that it can be a good source of information to evaluate a doctor's performance

and for comparing it with his/her colleagues' rates in addition to the local and global measurement rate. The patient medical record assists the doctor in his/her research and medical studies. Finally, the patient medical record is the legal document to protect the right of patients and other agents to take proceedings against the doctor (Huffman 1981).

Technological progress allows the electronic patient record system to provide total, cost-effective access to more complete, accurate patient care data and to offer improved performance and enhanced functions than can be used to meet information management challenges (Amatayakul 2005 and Novak 2005). As evidenced in Section 2.3.1, (p.30) the Kuwait Ministry of Health started to computerise the patient medical records by implementing the PHCS and the HCIS in the primary and secondary healthcare delivery system. The challenge for the planners in the MOH is to achieve the benefits of using electronic patient records to improve the quality of patient care whilst strengthening the scientific basis of clinical practice in a way that can contribute to the management and moderation of healthcare costs.

2.3.3 Health sciences libraries

Another feature of information provision in healthcare is that the MOH provides healthcare professionals with up-to-date health information by establishing several hospital libraries in most government hospitals and providing in-service training to the Librarians to improve their skills and experience. This training is provided by the Central Medical Library in the Kuwait Institute for Medical Specialization (KIMS). The Central Medical Library is attached to KIMS and acts as the central acquisition and distribution agency. It also functions as the apex body of the MEDLINE Network. The

library provides training in medical information technology and looks after the other library needs of the medical scientists in Kuwait, such as hospital libraries. In addition, it attempts to provide healthcare providers with up-to-date information in medicine through accessing a range of clinical resources including a collection of over 5,300 books and subscriptions to 550 periodicals and the MEDLINE Network (Chacko and Mathews 2009).

There are several health sciences libraries in Kuwait, most of which serve government ministries and agencies. Some libraries are for nongovernmental organizations. Most of these health sciences libraries were established during the 1980s. The oldest one is the Kuwait Medical Association Library (KMA), which was established in 1962. The latest is the Military Hospital Library at the Ministry of Defence, established in 1997. All of these libraries primarily serve health professionals consisting of physicians, dentists, pharmacists, veterinarians, allied health professionals, faculty members and students. Library and information science professionals working in these libraries consist of both Kuwaitis and expatriates educated in Kuwait and abroad (Al-Ansari and Al-Enezi 2001).

- Generally, health science libraries have common objectives, collections, users and services. The health sciences libraries in Kuwait can be categorized into three major groups:

- Academic health sciences libraries such as the Health Sciences Libraries in Kuwait University; the College of Medical Science Library (women) at The Public Authority for Applied Education and Training (PAAET); the College of Medical Science Library (men) at PAAET and the Nursing Institute Library at PAAET.

- Special Libraries such as the Central Medical Library in the Kuwait Institute for Medical Specialization (KIMS) and the Arab Centre for Medical Literature Library (Al-Ansari & Al-Enezi 2001). Hospital Libraries.

- There are several hospital libraries which are scattered in different hospitals in Kuwait such as Al Adan hospital, Al Amiri hospital, Al Jahra hospital, Al Razi hospital, Al Sabah hospital, Al Farwania hospital, Ibn Sina hospital, the Kuwait Cancer Care Centre (KCCC) hospital, the Maternity hospital, the Psychiatry hospital, etc. (Chacko and Mathews 2007).

2.4 Overview of the study hospitals

As mentioned in Section 2.2.2, there are six general public hospitals: Al Jahra, Mubarak, Al Farwania, Al Adan, Al Sabah, and Al Amiri. In 2006, the number of physicians working in the six general hospitals was 2,172 (El-Sayed 2006). For the purpose of this research, four general government hospitals: Al Amiri, Al Farwania, Al Sabah and Mubarak hospitals were selected from the six general hospitals. All the selected hospitals are general hospitals that provide therapeutic, preventive and rehabilitation services.

Al Amiri hospital is a general hospital located in Kuwait City (see Figure 2.4). It was the first hospital in Kuwait after the American hospital, built in 1941 and opened in 1949. At that time, it provided 45 beds and rooms for operations, a laboratory and a pharmacy. The hospital has been expanded several times and was torn down and rebuilt in 1984.

Figure 2.4: Al Amiri hospital building

Now, Al Amiri hospital is equipped with an outpatient service and serves around 400,000 people. It has 374 beds and has a total of 354 doctors (El-Sayed 2006). The hospital has a small library with a small collection. It has desktop computers with access to the Internet. The Healthcare Information System has been recently introduced to the hospital and is undergoing development.

Al-Sabah Hospital is one of the oldest and biggest hospitals in Kuwait. It is fully equipped with modern equipment. It was built in 1960 and opened in 1962. The hospital is divided into several buildings but they are scattered in the Al Sabah region. It has 358 doctors and 438 beds (El-Sayed 2006).

Al Farwania hospital is another general hospital in Kuwait, built in 1980. It includes several specialist medical departments such as surgical, internal medical, gynaecology and obstetrics, paediatrics, ENT, orthopaedics and dermatology. There are 381 doctors working in Al Farwania and it has 523 beds (El-Sayed 2006). A small library exists in

the hospital with an Internet connection. Also, the Healthcare Information System is implemented in the hospital.

The fourth hospital is Mubarak Al-Kabeer hospital, a general hospital built in 1982 in the Jabriya area in Kuwait (see Figure 2.5). The hospital was named after Sheikh Mubarak Al-Kabeer Al-Sabah. It serves the Hawalli region and covers about 700,000 people in the area. The hospital provides all medical and surgical services in addition to training and teaching services to all doctors and students. It has 409 beds and there are 441 doctors working in Mubarak hospital (El-Sayed 2006). The hospital is attached to the Health Sciences Faculty which has a Health Sciences Library. Also, the Healthcare Information System has recently been introduced within this hospital.

Figure 2.5: Ward area in Mubarak Al-Kabeer hospital

2.5 Summary

In conclusion, in Kuwait, as in other countries, healthcare services occupy an important and significant position amongst the decisions made by the government. Technological

advances and the flow of information are encouraging the healthcare authorities in the Kuwaiti Ministry of Health to look for facilities and systems for improving the management of information in the healthcare delivery system. The MOH planners are attempting to provide high quality care by providing healthcare professionals with the information they need. Paper patient records, HCIS and hospital libraries are examples of clinical information sources available in the healthcare delivery system in Kuwait. Indeed, all these clinical information sources and other sources are discussed in the literature review in the next chapter and some are investigated in this research since they play an important role in supporting the decision-making and medical practice of doctors. Thus, understanding information users' needs and identifying the way information flows through the healthcare organization are essential issues in developing a successful system and improving the quality of services in any organization or society. This chapter provides a general picture of the information provision in Kuwait. The next chapter reviews the literature addressing the information needs of doctors and their information-seeking strategies from different perspectives and in different contexts, so encompassing a holistic approach to the research problem.

Chapter Three

Literature Review

3.0 Introduction

This literature review chapter begins with brief information on how a systematic search of the literature was conducted. It focuses on doctors' information needs in everyday practice. The literature was organised into five major categories: firstly, the history of user studies and related concepts; secondly, the information needs of doctors; thirdly, doctors' information-seeking and the types of sources of clinical information used by doctors in their professional practice; fourthly, the factors that affect doctors' decision to use particular clinical information sources and finally the literature recognising the problems in obtaining the information needed. In addition, examples of common conceptual information-seeking models are identified. The chapter concludes with a brief summary of the literature that has been reviewed.

3.1 Searching the literature

Despite the large amount of literature in user studies such as information-seeking behaviour and information needs, only a small amount was found in the medical area, particularly literature concerning the information-seeking and information needs of doctors working in hospitals. Thus, the researcher has followed a strategy to help discover more key topics and terms to build the framework of research theory. The steps are developed from different sources by reviewing literature (Gash 2000, Hart 2001 and Battelle 2005), attending workshops provided by the Library at Loughborough University and consulting with information professionals working in Loughborough University Library. As a first step, the researcher started to find appropriate keywords using the following strategies:

- Underlining keywords in the research problem. This can be achieved after understanding the subject area.

- The researcher reviewed the research statement of the problem and the research questions. Then themes and sub-themes, which helped in locating all the keywords related to the research topic, emerged from that.

- Refining the research subject by talking to supervisors, experts and research students. The researcher reviewed the statement of the problem and research questions with her supervisor, joined in e-mail discussions and asked information professionals who worked in the library at Loughborough University for help in providing more terms and associated subjects related to the research topic. This helped the researcher to define the topic from different views and aspects.

- Reading articles and books related to the research area. For instance, the researcher read the book "Looking for Information" (Case 2007) which helped in understanding several associated terms e.g. seeking-behaviour, information-seeking behaviour, information needs, conceptual models and decision-making.

- Another method of locating keywords was to find abstracts of journal articles related to the research problem. Also, keywords were sought from journal indexes.

- Searching for synonyms. A thesaurus was also used to look for synonyms of the terms. For example:

  - Seeking (seek, look for, search, explore and pursuit).
  - Information (resources, literature, data and knowledge).
  - Doctors (physicians, practitioner, clinic, consultant and specialists).
  - Health (medical and clinical).

Several literature resources were searched to locate the appropriate information resources relevant to the research problem including: the online library catalogue, the online gateway and Metalib (databases, e.journals and e.books). Examples of databases that were searched include: ABI research, Emerald, Science Direct and Web of Sciences. Other print resources were used including books, textbooks, conference papers, government documents, theses and journals. In addition, search strategy techniques were used to search online resources and find search titles that were more relevant to the research problem. For example, Boolean operators (OR, AND, NOT) were used to narrow or broaden the research problems. Some examples of search sentences that were used are:

- (Information OR knowledge OR data OR literature) AND (physicians OR clinicians OR general practitioners OR podiatrists) AND (hospital OR primary care).

- (Information OR literature) AND (seek OR use OR search) AND (physicians OR clinicians OR general practitioners).

- (Resources OR sources Or literature) AND (physicians OR clinicians OR general practitioners OR paediatrics).

- (Paper OR electronic) AND (medical OR patient) AND (file OR record) AND (physicians OR clinicians OR general practitioners OR consultants).

In addition, the search was specified by time period, country, document format (e.g. PDF), title, abstract and language. Electronic current awareness services that enable the researcher to keep up-to-date with new books, journal articles and conference papers in the research area relevant to this study have also been used.

3.2 User studies

3.2.1 A brief history of user studies

One of the most commonly researched areas in the field of information science is user studies. Banwell and Coulson (2003) outlined some examples of topics and subjects that are involved in user studies. They mentioned that they focus on investigating user wants, needs, contexts, expectations and tasks. In addition, user studies spotlights a use area by investigating what the particular information sources are used for and also examining the different barriers and obstacles to these uses. Another related area of user studies is concerned with information systems or services, which explore the different aspects of

technology, design and evaluation. User studies also focus on the organisation by considering the contextual aspects of the organisational setting. For example, they investigate the internal and external factors of the organisational setting (e.g. resources, internal management procedures, internal and external strategies), which are all elements of, or enhance, a holistic case study.

The user studies area has been examined by many information researchers in different fields such as science, medicine, law and education. The foundation of user studies was in the late 1940s, when Urquhart and Bernal reported their research findings at the Royal Society Scientific Information Conference in 1948 (Siatri 1999 and Wilson 2000b). Urquhart (1948) emphasized the distribution and use of scientific and technical information, while the study conducted by Bernal (1948) using questionnaires and diary cards intended to discover directly from working scientists what they had read, for what purpose and the benefits of using this information. A critical issue was raised by Wilson (1994) that although the foundation of user studies was in late of 1940s, the subject was covered in some studies preceding that period e.g. a library survey study was provided by McDiarmid in 1940 and covered several issues about the use of libraries and the needs they sought to satisfy.

The literature review shows different stages of the history of user studies. Siatri (1999) indicated five periods in the history of user studies. The first period was from the late 1940s to 1959. The few early studies involved scientists specialising in biochemistry, medicine, engineering and physics. Siatri (1999, p.133) argued that this focus on the sciences arose because the "publication of professional and scientific information in these disciplines was much more developed at the time in comparison with the humanities". This led to the development of tools for information handling such as

abstracts and indexes. Some examples of these early studies are Tornudd (1953), Shaw (1956), Maizell (1957), Fishenden (1958) and Glass and Norwood (1959). Different methods of data gathering were used in these studies including questionnaires, diaries, reference counting and interviews. For example, Shaw (1956) conducted a pilot study to investigate the use of scientific literature by scientists. A questionnaire and diary cards were the data-gathering methods used in that study.

The second period indicated by Siatri (1999) was in the 1960s. In this period, the number of user studies increased rapidly. The studies branched off to include fields other than science. In addition, studies moved to answer more complicated questions. The most common research work in this period came from the American Psychological Association (APA) which conducted a series of studies in 1963 concerning psychologists, which was the most important project to date in the social and behavioural sciences (Siatri 1999).

User studies increased in the 1970s. The studies presented a variety of target user groups like magistrates, urban citizens, personnel working in local authorities and university students (Siatri 1999). The use of a particular information system and it is effectiveness was another research trend in the 1970s (Siatri 1999). In the UK, the establishment of the Centre for Research on User Studies (CRUS) at Sheffield University in 1975 was an important development in this period. Several studies were conducted by this Centre (Roberts and Wilson 1988). One of the most important studies was conducted by Ford (1977), which presented a guide in defining the scope of user studies, and recommended a hypothesis about the behaviour of information consumers. The CRUS also provided training courses and seminars in research methods and published occasional papers and guides on research methods for user studies (Wilson 1994).

In addition, Siatri (1999) pointed to the 1980s as a period of increasing awareness of the conceptual framework and methodological issues of user studies. Moreover, Ingwersen and Jarvelin (2005) stated that several models of information-seeking were developed between 1966 and 1981. They provided some examples of models that have been created, including those of Paisley (1968) and Allen (1969). In the 1980s, a new dimension arose through the formulation of theories and models of the information-seeking behaviour of different groups. Important models developed in this period include that of information-seeking behaviour by Wilson (1981). Dervin (1983) developed the Sense-Making model and Ellis (1987) proposed a general model of information-seeking behaviour; more details about these models and other models are given later on in this chapter.

During the last two decades, the quantity of literature about information-seeking issues has flourished substantially (Siatri 1999, Leckie, Pettigrew and Sylvain 1996). Advances in technology and information overload are two important factors enhancing the literature of user studies. The development of information technology, such as the Internet, has been the most researched issue in many studies. Most user studies, such as those by Tillman and Ladner (1993), Cromer and Johnson (1994), Eager and Oppenheim (1996) and Abels, Liebscher, and Denman (1996) are examples of studies conducted to emphasise the effect of the Internet on users and the information community. For instance Cromer and Johnson (1994) explored the impact of electronic media and the Internet on communication among reference librarians. Perry (1995) and Bruce (1995) used qualitative methods to study user behaviour on the Internet. Wilson (2000a, p.53) also pointed out that there was a new issue emerging in user studies, 'information-seeking and the World Wide Web'. This issue extended the context of user studies.

A number of researchers have improved their modelling of information seeking. For example, based upon Leckie's 1996 model, Wilkinson (2001) developed a model based on the information sources used by lawyers in problem solving. Godbold (2006) developed a new model of information behaviour which replaced the notion of 'barriers' with the concept of the 'gap', as a means of integrating the views of Wilson and Dervin. In addition, Bates (2002) developed an integrated model of information-seeking and searching. There has been a strong increase in the number of user studies in different contexts in recent years. Several terms and concepts associated with these studies are discussed from different perspectives in the next section.

3.2.2 Definitions of important terms

Different terms are associated with the user studies area such as information, information need, information seeking, information-seeking behaviour and decision-making. These terms are defined by different people in different ways. The several different definitions of some terms have raised some uncertainty in user studies.

3.2.2.1 Information

One of the most important concepts that create uncertainty in user studies is 'information'. The definition of 'information' has been a problem for over 50 years, since before the term "Information Science" was coined in 1955 (Madden 2000, p.343). The literature review identified several definitions of the concept of information. Wilson (2006, p.659) said that the difficult part in understanding information needs is recognizing the concept of 'information' being used. Various definitions have emerged,

e.g. for 'data', 'information' and 'knowledge', and recently there have been challenges to the idea of a single concept of 'information' for 'information science'. Wilson also suspects that, as well as the need for a single definition, there is a failure to use a definition suitable to the level and purpose of the investigation. Thus, the failure to make clear the definition being used in a particular context will cause misunderstanding with the reader being left to work out which meaning is being used by reading the paper or report. Case (2007, p.66) argued that there are extensive disagreements about what would create a general definition of information. Most of these disagreements concern the issues of truth (true vs. false); physicality (book, sound wave); intentionality (i.e. assume that something intends to communicate to another entity); structure or process (i.e. is the information a process or must information be structured in a particular way); and utility (e.g. the kind of effect of information for humans). He suggested six requirements for a universal concept of information, which are:

- "Allow for the common-sense notions of information used in everyday discourse.

- Allow for unintentional origins of information (e.g. observation of the natural world) as well as for purposeful communication among people.

- Allow for internally generated information (e.g. memories, constructions) as well as externally generated information (e.g. reading a text).

- Allow for types of information beyond that needed for solving a problem or making a decision.

- Admit the importance of informal sources (e.g. friends) as well as formal sources (e.g. data or documents).

- Involve the human mind, either in the creation, perception or interpretation of information; to leave out such a requirement is to declare that anything is information and that would leave us with no focus in our investigations".

The literature is enriched by many definitions of the term information. McCreadie and Rice (1999, p.46) provided a comprehensive definition of information. They reviewed six pieces of research literature, which considered different points of view in order to identify the concept of information. They considered the following concepts:

- *"Information as a representation of knowledge"*. This is concerned with information as stored knowledge. It tends to be in carrier materials such as documents, books, periodicals and also in electronic media (e.g. CD and Internet).

- *"Information as data in the environment"*. This concept relates to information that can be obtained from a range of environmental stimuli and phenomena; not all of which are intended to 'convey' a message, but which can be informative when appropriately interpreted.

- *"Information as part of the communication process"*. This is the notion that meanings are in people rather than in words or data. Human behaviour is the basis for understanding the process. There are two factors; timing and social factors that have an impact on the processing and interpretation of information.

- *"Information as a resource or commodity"*. This notion supports the idea that information is transmitted in a message from sender to receiver. It assumes that the receiver interprets the message in the way intended by the sender.

A simple definition was provided by Chen and Hernon (1982, p.5) who defined information as "all knowledge, ideas, facts, data and imaginative works of mind which are communicated formally and/or informally in any format". On the other hand, Case (2007, p.5) provided the broad definition that "information can be any difference you perceive, in your environment or within yourself. It is any aspect that you notice in the pattern of reality". Awad and Ghaziri (2004, p.36) explained the word information. They said that information is obtained from the word 'inform', which means 'to give shape to'; therefore, information means determining the data to arrive at meaning in the eyes of the perceiver. Information is a set of data that makes a decision easy. It is also facts and figures based on processed data. Moreover, information has been defined from perspectives related to subject and purpose. Ingwersen and Jarvelin (2005, p.20) defined information from the perspective of Information Science. They indicated that information must fulfil two main constraints: "On the one hand information being the result of a transformation of a generator's cognitive structures (by intentionality, model of recipients' states of knowledge and in the form of signs). On the other hand being something which, when perceived, affects and transforms the recipient's state of knowledge". On the other hand, Wyatt & Sullivan (2005), Wyatt (1996) and Shortliffe *et al.* (2001) defined information from a health informatics perspective. They defined it as an organized body of data or knowledge which is communicated and used by human or computer agents in order to make decisions and guide actions.

3.2.2.2 Information needs

Another difficulty faced by researchers in the user studies area is the distinction between information needs, demands, wants and use. Elayyan (1988) indicated that a number of user studies which have purported to be of information needs have actually been of

information use. Brittain (1975) mentioned that there is uncertainty present in the term 'use'. Usually studies consider the gathering stage of 'use' rather than 'the use to which the information is put once it has been collected'. This, sometimes unappreciated, problem has overwhelmed some studies of information needs and uses.

Another ambiguity is that some early researchers have determined use studies as channels studies. Kunz (1977) explains that use studies are often "channels studies, it is studies of the actual frequency of use of particular information channels (journals, books, abstracting services, conferences and others) by scientists and other professions". Menzel (1960) makes the following distinction: when approached from the point of view of the individual scientist, these use studies are studies of scientists' communication behaviour. When approached from the point of view of the scientific communication system, they are studies of the flow of information. Nicholas (2000) stresses the need for distinguishing information needs from closely related concepts such as 'use', 'demand' and 'want' when assessing information needs. He believes they are different and do not accurately describe need. Then he defines the three concepts separately. Information need is "the information that individuals ought to have to do their job effectively, solve a problem satisfactorily or pursue a hobby or interest happily" Nicholas (2000). 'Ought' implies that a value judgment is recognised as important if the need of the person is to be meet, e.g. the provision of the information needed to work efficiently, effectively and safely. On the other hand, information wants can be defined as what an individual would like to have, 'like' being the operative word. Information demand is a request for an item of information believed to be wanted. When a user starts to seek information he/she is likely to meet an information professional and interact with an information system, source or intermediary. In addition, Nicholas (2000) explained the term information use as meaning more than satisfied demand (intended use) for it may also be the result of

browsing or accidental discovery (while not looking purposively for anything or when looking for something else). Although it is thought of as a simple and frequently used word, 'use' has a complex and varied spectrum of meaning. There are different levels of use which can be distinguished. The first level of use simply involves determining whether something is worth using in the first place. That use may satisfy or fail to satisfy need. The second level is the use or consumption of information that is determined as being relevant.

Even so, the term 'information needs' has been defined by many researchers. Chen, Schuffels and Orwig (1996, p.88) provided a simple definition. It is an "abstract construct used to represent why people seek, find and use information". Van de Wijngaert (1999 p.463) defined information need as a process and indicated that "a need for information consists of the process of perceiving a difference between an ideal state of knowledge and the actual state of knowledge". In addition, information need has been identified as determining the awareness of the gap in the knowledge. For example, Ingwersen and Jarvelin (2005, p.20) stated that information need means "a consciously identified gap in the knowledge available to an actor. Information needs may lead to information-seeking and formulation of requests for information". In addition, Case (2007, p.5), defined information need as "a recognition that your knowledge is inadequate to satisfy a goal that you have".

3.2.2.3 Information-seeking behaviour

The term' information-seeking behaviour' has also been used in several user studies. The literature review shows a distinction between the terms 'information seeking', 'information-seeking behaviour' and 'information behaviour'. Chen and Hernon (1982,

p.6) defined the concept of information-seeking behaviour or information-seeking as one term. It is "the paths pursued by individuals in the attempt to resolve an information need". However, Wilson (2000a, p.49) made a distinction between the terms information behaviour and information-seeking behaviour. He defined information behaviour as "the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking, and information use. Information behaviour includes face-to-face interactions, as well as the passive receiving of information from, for example, watching television advertising, without having any intention of acting on the information provided". On the other hand, he defined information-seeking behaviour as "purposive seeking for information as a consequence of a need to satisfy some goal. Individuals interact with two paths when seeking for information: manual information systems e.g. newspaper or a library and computer-based systems such as WWW".

Additionally, Case (2007, p.5) differentiated between the terms information-seeking and information behaviour. He defined information-seeking as "a conscious efforts to acquire information in response to a need or gap in your knowledge". But information behaviour "encompasses information-seeking as well as the totality of other unintentional or passive behaviour (e.g. encountering information), as well as purposive behaviours that do not involve seeking, such as actively avoiding information". Zerbinos (1990, p.922) recognized two features of information seeking: firstly, information-seeking occurs "when a person has knowledge stored in long term memory that precipitates an interest in related information as well as the motivation to acquire it". Secondly, "it can take place when a person recognizes a gap in their knowledge that may motivate that person to acquire new information".

In spite of this, Siatri (1999) sees the term 'information need' as closely related to the concept of 'information-seeking behaviour'. A user can identify information need,

express it as a question or request and transfer it through formal or informal channels of communication and information systems in order to obtain a written, verbal or visual response, which will meet this need. Decisions concerning the channels of communication and information to be used, as well as the manner in which the request for information is made, rest with the user. Case (2007, p.80) believed that information-seeking is more closely tied to the concept of "need" than it is to the notion of "information" itself. For instance, Wilson (2000a, p.49) has said that information-seeking is "the purposive seeking for information as a consequence of a need to satisfy some goal".

The literature review indicates the relationship of 'information-seeking' and terms such as 'decision-making' and 'problem solving'. Case (2007) discussed the relationship of decision-making to information-seeking, finding some parts of it relevant. He stated that it is expected in professions such as managers, scientists, engineers and lawyers. Seeking of information has often been characterized in terms of problem-solving and decision-making. Decision-making is usually described as a choice made from among alternatives in which decision makers may decide on only one of them. In some situations, the decision maker must seek and gather information that allows each potential choice to be evaluated and compared to the alternatives (Case 2007).

Often decision-making is used to identify uncertainty. There is evidence in some literature that uncertainty is a key concept in decision-making research, as it has been in information-seeking (Belkin 2005 and Ford 2004). Uncertainty is often experienced with negative feelings such as risk, fear and danger. Kuhlthau (2004, p.23) stated that:

"Interpreting, choosing, and creating the inconsistent, often incompatible information encountered is likely to cause profound feelings of uncertainty, confusion, anxiety, and even threat".

A review of the history of user studies indicates that the scientific area, such as medicine, is a subject of great interest and has been studied in many different contexts. The next section discusses these related concepts and sees where and how they fit in for healthcare professionals and particularly doctors.

3.2.3 User studies of healthcare professionals

Numerous studies have addressed the information needs of selected professions such as those involved in the medical field. The information needs and information-seeking behaviours of healthcare professionals (doctors, nurses, allied health professionals and administrators) are considered particularly worthy of investigation. The area of medicine attracts researchers for several reasons. Case (2007, p.10) mentioned that "all people seek information, yet for some people and in some situations the stakes are much higher". High-stake situations, e.g. the information needs of a scientist who is working on a treatment for heart disease that might affect millions of lives, often attract research. By studying the information needs of such scientists, and how they go about satisfying those needs, we may be able to devise a tool or service that would help them reach their research goals a little sooner and potentially contribute to the public good.

Another important reason for investigation is that the healthcare environment is the area for the prevention, treatment and management of illness and the preservation of mental and physical well-being through the services offered by healthcare professionals.

Generally, the structure of this environment is divided into three categories of care: primary, secondary and tertiary. The UK and Kuwait have similar healthcare structures. However, secondary care (e.g. hospitals) in the USA is quite different to that in the UK and Kuwait. There has been a trend in the USA toward self-referral by patients for these services, rather than referral by primary care providers, as is the practice in the UK, where all patients must first seek care from primary care providers and are then referred to secondary and/or tertiary providers, as needed (The California Wellness Foundation 2007). The flow of information in this environment is very complex.

Obviously, healthcare professionals constantly working in this complexity need to have extensive access to information and/or guidance. Therefore, investigating services or systems that could improve the provision and accessibility of information in this environment is likely to be helpful. User studies are a vital tool to help information professionals improve both their understanding of the use and delivery of information and to adapt to new technologies and the information explosion (Saitri 1999). Ucak and Kurbanoglu (1998) said that the knowledge obtained from user studies could assist in the development of information systems and services. Ocheibi and Buba (2003) agreed that communicating with users and understanding their needs helps in developing a system but a deeper insight into information needs is required by the formal researcher.

The vast quantities of information in the medical literature and advanced technology such as the Internet have led to a proliferation of user studies in this area. Nylenna and Aasland (2000) said that the increasing pace of change in medical knowledge makes it difficult for healthcare professionals to keep up to date. Smith (1996) indicated that most doctors are facing difficulties in controlling the current amount of scientific information, whilst researchers' knowledge about doctors' information needs and how they are met is

limited. Case (2007) claims that the Internet might be used as a metaphor for information behaviour. For example, for a doctor, searching for information on patient care using the Web is different from searching for information in traditional books and journals. Using different channels of communication plays a significant role in extending the information behaviour area. Information-seeking becomes more holistic.

All the above are examples of significant features regarding health-related information; however, there are ever more issues arising and an increasing need to stay informed about them. As indicated above, there has been a strong interest in research related to healthcare professionals. The literature search revealed some studies that investigated the information needs and information behaviours of nurses (Fakhoury and Wright 2000, Cogdill 2003 and Dee and Stanley 2005). For example, Dee and Stanley (2005) used questionnaires, interviews and observations to investigate the information-seeking behaviour of nursing students and clinical nurses. The results showed that nursing students and clinical nurses were most likely to rely on colleagues and books for medical information. As well as the user studies of nurses, there have been studies exploring how physiotherapists use information (Bohannon 1990 and Ashcroft 1998). Other studies have examined the information needs of allied health professionals together (e.g. nurses, radiologists, physiotherapists) (Dorsch 2000 and Haigh 2006).

In addition to the above healthcare professionals, there have been a number of studies investigating doctors and their information needs and information seeking. Generally, doctors work in three levels of healthcare delivery services including: primary, secondary and tertiary. The central job of doctors is to apply medical knowledge and skills to the diagnosis, prevention and treatment of illnesses, diseases and infections in patients. The literature review found some research interest in studying the information

needs and information-seeking of doctors who work in primary care (family centres, GPs etc.) as well as doctors who work in the secondary (e.g. hospital), level. Both of these groups share the same purpose of providing patient care and building a healthy society. However, the range of responsibilities of the two groups is different. The primary care physician is defined as a clinician working in the first line of patient care as a general practitioner (family physician) and/or community health officer (combining general practice and public health responsibilities). The hospital doctors were defined as clinicians working in a hospital (Nylenna and Aasland 2000). Hospital doctors engage in many duties, including the treatment of patients who are referred by primary care doctors (see Chapter One, page 2).

The wide responsibilities of hospital doctors do not detract from the role of primary care doctors and their need for information. Verhoeven, Boerma and Jong (1995, p.85) point to the importance of studying the use of information sources by family physicians for both practical and theoretical reasons. First, family medicine is a small field with a growing scientific output. "Due to the interdisciplinary nature of this field, the effective use of information sources can be a complex challenge, particularly because an understanding of bibliographies is not yet common". Second, investigating the information sources used by GPs may possibly identify opportunities for improving the services offered by librarians and information specialists. Coumou and Meijman (2006) stated that although primary care physicians do not know everything, they are familiar with the diseases that are met in general practice. They are not expected to have direct knowledge of rare diseases, specialist problems and the rapid progression of technological developments. However, they like to keep up-to-date with clinical evidence for the benefit of themselves and their patients and so that they can communicate with their colleagues. Nylenna and Aasland (2000) studied the continuing

medical education (CME) of primary care physicians and their information-seeking and compared it with that of hospital doctors. They indicated that primary care physicians used several information sources in their professional updating. However, they were less interested in doing this than their hospital colleagues. Thus, investigating the information needs and information-seeking of primary care doctors was a fruitful area of research and attracted many researchers such as Gorman (2001) Wilson, Glanville and Watt (2003) and Magrabi *et al.* (2005).

There are also studies of information needs and information-seeking by hospital doctors, but the number is not large compared with those concerning primary care doctors. Due to the small number of studies of hospital doctors, the literature review in the next section focuses on the information needs and information-seeking of both hospital and primary care doctors to enrich the discussion and context. The study conducted by Tan *et al.* (2006, p.713) investigated the use of information resources by clinicians (doctors, nurses and pharmacists). They pointed out:

"The information-seeking processes are not specific to clinician group, rather they are context specific and vary from clinician to clinician, day to day and ward to ward".

The results of the study by Gorman, Yao and Seshadri (2004), revealed that there were no differences between the information needs- seeking and the use of knowledge information resources of rural and non-rural clinicians in Oregon.

3.3 Information needs of doctors

3.3.1 Categories of information needs

There is no doubt that for doctors, as any other professionals, information is crucial to their medical practice. Generally, people need information for their daily practice, Chen and Hernon (1982, p. 3) stated that:

"People want accurate information to guide them in making intelligent decisions about issues that concern them. They want to know how to find the government services they need to solve their problems. They want information on how to adapt to the rapid changes taking place in their environment. They want to expand their knowledge and range of choices through education."

In the matter of doctors' information needs, the nature of the doctors' profession requires information (Hersch and Lunin 1995). The information need of doctors was categorised more specifically by Gorman's (1995) study. He identified four types of doctors' information needs:

- *Unrecognised needs.* This type of need occurs when doctors are not aware of the information they need or their knowledge is insufficient to fulfil the needs (knowledge deficit). Unrecognised needs should be deduced from doctors' knowledge or observation of clinical practices. This need cannot be predicted with an information system because the user cannot recognise their need. However, new technology systems such as reminder systems and clinical-decision-support systems are ideal sources of information to address unrecognised needs.

- *Recognised needs.* Here there is awareness that information is needed. It is either articulated by doctors or can be inferred by on observer. It may result in a search for new information or it may not.

- *Pursued needs.* Here, information-seeking occurs which can be observed or recalled at a later time.

- *Satisfied needs.* This is a subset of pursued needs and it refers to when the pursuit of information is successful.

In general, the reason for doctors' information needs was provided by Chambliss and Conley (1996) who pointed out that doctors need information for two main reasons: a) information to answer specific patient queries; b) information to be updated with current improvements in the medical field. The literature review indicated that doctors' information needs are investigated by many studies in different contexts. These different views and the studies presenting them are discussed in the next section 3.3.2.

3.3.2 Information needs in different contexts

There is a great focus in the literature on investigating the information needs of doctors by studying the frequency and types of questions identified by doctors through different scenarios. This is a critical issue according to Barrie and Ward (1997) who distinguished between information needs and questioning behaviour. They argued that studies which focused on doctors' information needs may possibly give an inaccurate picture of questioning behaviour because information needs may be recognised or unrecognised and are independent of doctors' behaviour, which is a normative concept. However,

questioning behaviour is an empirical one; it is the process by which a doctor recognises the need for information.

Some of the studies that have focused on doctors' information needs, have investigated the type and frequency of doctors' clinical questions which arise through patient encounters or before seeing a patient or after the patient has been seen. The writers stress that doctors' information needs usually arise during their medical practice (Covell, Uman and Manning 1985, Green, Ciampi and Ellis 2000, and Seol *et al.* 2004). Smith (1996, p.1062) stated that "when doctors see patients they usually generate at least one question; more questions arise than the doctors seem to recognise". Several research approaches have been used to investigate doctors' information needs in the form of clinical questions including qualitative methods (observation and interviews) and quantitative methods (surveys). The early study by Covell, Uman and Manning (1985) investigated the information needs of 47 Internal Medicine doctors in their outpatient practice. The results of the closed questionnaire, which was completed by doctors before the office interview, indicated that they needed information about once a week. However, the interview conducted after each patient was seen (1-16 patients were seen over the course of half a day), found that 269 questions were raised during the interview after 409 patient visits. Doctors raised about two questions for every three patients and most questions were about diagnosis, treatment, drugs and other medical opinions and patient management. Other similar studies have been undertaken in different health settings including that of Osheroff *et al.* (1991) who observed 24 doctors and medical students in the university-based general medical service at Pittsburgh. The participants cared for 90 patients. The participants had 519 information requests during 17 hours of observation of inpatient and outpatient activity. There were 454 information requests (5 for each patient), particularly for clinical care, such as related patient care, about specific

patients and also some for treatment and drugs. Green, Ciampi and Ellis (2000, p.218) studied the information needs of "residents in university-based primary care internal medicine program" in two hospitals in the USA. Sixty-four residents were interviewed after 401 of a total of 404 patient encounters. The participants identified 280 questions (2 for every 3 patients). Most questions arose about therapy (38%) and diagnosis (27%). In addition, Ely *et al.* (2005) observed 48 physicians (approximately 16 hours of observation for each doctor) in half-day observation periods of 4 hours. There were 1,062 questions raised by doctors for patient care, on average 5.5 questions per doctor per half-day observation period. González-González *et al.* (2007) recorded 3,511 patient consultations; 7.8 minutes mean length per consultation. There were 635 clinical questions generated by 112 doctors with an average of 0.18 questions per consultation. Most questions generated by participants related to diagnosis (53%) and treatment (26%). Cheng (2004) adopted triangulation methods to investigate clinical questions posted by hospital clinicians. The results showed that 75% of the participants reported clinical topics, 19% managerial, 3% healthcare-related and 3% were for education and teaching.

A number of studies have analysed the questions generated by doctors through searching online resources. Alper, White and Ge (2005) analysed 780 clinical questions searched (using DynaMed database) by 60 participants from a total of 82 between January 2004 and June 2004. The clinical questions varied in terms of subject area, complexity and clarity. 45% of the questions were related to treatment, 22% to diagnosis, and there were a few questions about etiology, adverse effects of treatment, epidemiology, prognosis and prevention. In addition, Magrbi *et al.* (2005) investigated the information needs of general practitioners using online evidence during consultations. They found 193 of a total 227 GPs used the online evidence system to conduct 8.7 searches per month. The

majority conducted the search during a consultation and the most frequent needs for a search were related to diagnosis (40%) and treatment (35%).

Other studies have investigated the information needs of doctors by examining a list of reasons for their information needs and identifying the highest ranking needs indicated by doctors. Pyne *et al.* (1999) conducted a qualitative research study to discover the information needs of clinicians in four Acute and Community Trusts in and around London, UK. The results indicated that 15 doctors, out of a total of 18, needed information to keep up-to-date with changes in their speciality. However, few appeared to be searching for information to help them in making clinical decisions. Bryant (2004) used a mixed method approach to data gathering when exploring the information needs and information-seeking behaviour of family doctors. The techniques used were case studies, interviews and group discussion. The findings of the study showed that doctors ranked clinical care first, keeping up-to-date was the second ranked need followed by information for patients. Other needs which were ranked lower were items such as pharmacological information, gaps in knowledge, curiosity and uncertainty. In addition, the survey results of McKnight *et al.* (2002) identified three categories of doctors' information needs: patient-specific information, institute-specific information and domain-specific information. The majority of doctors revealed patient-specific information needs, such as a list of current medication and the time it was administered; information from outpatient notes and lab and other tests results. In addition, the survey study of Ocheibi and Buba (2003) indicated that doctors need information for five purposes ranked as follows: 31.4% to keep up with current developments; 27.1% to support research work; 21.4% to develop competence; 11.4% to develop educational materials and 8.6% to carry out administrative tasks. The study conducted by Khudair and Cooke (2008) investigated the use of e-information sources in eleven government

hospitals and health centres in Riyadh. The questionnaire results showed that 44.4% of respondents (doctors, nurses and other healthcare providers) indicated that they looked for information to keep up-to-date, 31.2% for clinical work and 7.5% for writing a paper. Other reasons for information needs identified were examinations and teaching. However, the respondents' job descriptions were found to be significantly associated with their information needs. They found that information-seeking for clinical care and to keep up-to-date was a greater need for nurses than for doctors, while the need for information for education and research was greater for doctors than nurses.

In recent years, the concept of consumer health information has emerged as a new reason for doctors to need information. Physicians are increasingly experiencing patients bringing Internet printouts to a consultation (Van Rijen, De Lint and Ottes 2000 and Wolffenbuttel and Van Woerkum 2000). Wilson (1999) found that 58% of patients used the Internet for health information. However, the result by Potts and Wyatt (2002) showed that 748 (94%) of doctors estimated that only 1%-2% of their patients used the Internet for health information. Van Woerkum (2003) outlined some reasons for people obtaining health information from the Internet including the feeling that that they could not obtain such information from their doctors. Also people obtain information from the Internet to verify a medical opinion or treatment. In addition they need information to overcome their reticence in discussing personal issues, since they felt that such discussions could overwhelm them. Thus, the experiences of doctors are changing because they are interacting with patients who are using the Internet and some patients are better informed than previously. They ask doctors many questions and they also demand more information and feedback. Certainly, doctors need readily-available information so that they can respond to patient information needs deriving from their access to the Internet. Also doctors seek information to improve the education of the

patient about his/her case. The pilot study conducted by Dorsey and Detlefsen (2005) analysed the type of information sought by primary care doctors, the time spent seeking information and the methods the doctors used to find the information to provide support to their older depressed patients and their family caregivers. The majority of doctors specialised in Internal Medicine. There were four categories of information including: information for clinical care; personal study or CME; information for patient education and information for evidence-based practice. The overall results showed that the average time doctors spent seeking information to satisfy all the categories of information was 0-10 hours per week. In addition, the study showed the most common method doctors used to find information for patients were Internet search engines; up-to-date software and communication with colleagues via email, telephone or face-to-face.

In addition, the information needs of doctors have been investigated in the context of scenarios. Zeng and Cimino (2000) examined the information needs of doctors in both outpatient and inpatients settings and identified three types: The source-oriented view organized needs by where the data are collected. Time-oriented needs are organized by when the data are collected and the concept-oriented needs are organized by the content of the data. The results of the study showed that the utilization of these three views was different from one case to another according to certain situations. For example, source-orientation will be ideal when doctors want information by location. Also, time orientation will be helpful when doctors want information by a specific time e.g. today. In the situation when doctors want information by content e.g. symptoms of a diabetic case, the concept oriented view can be beneficial. Even though there may not always be an advantage of one view over another in some situations, they confirmed the idea that "physicians need different types of views".

Another approach to assessing doctors' information needs is investigating the reasons for using diverse information sources such as online resources, the hospital library, asking colleagues and other resources. The literature review showed that a variety of information needs of doctors are revealed through the use of different resources. However, obtaining clinical information for patient care was the focal point of many questions. Wyatt (1996, p.314) stated that "Clinical information is the commodity used to help make patient care decisions". Steel and Goncalves (2000) agreed that clinical staff require information in order to treat patients effectively. Thus, access to a wide variety of information is critical to doctors. So far, studies have indicated doctors' information needs through the use of the Internet and online resources (Bowden, Kromer, and Rajia 1994, Ajuwon 2006 and Bennett *et al.* 2006) hospital and health libraries' resources and services (Pyne *et al.* 1999 and Ali 2000), personal collections (Dorsch 2000 and Tenopir *et al.* 2007) and communicating with colleagues (Gorman 1995, Tan *et al.* 2006 and Perley 2006). Most of the literature studies investigating the information needs of doctors have been extended to examine the information-seeking behaviour of doctors. Thus, the above studies and other studies will be discussed in more detail in the following sections.

3.4. Information-seeking behaviour of doctors

It is evident from the literature that the process of information-seeking is not identical in every situation; it is different from one scenario to another. A number of contextual factors have been investigated by many of the studies undertaken to identify the information-seeking strategies of doctors including: organization settings (e.g. primary

care and secondary care), sources orientation (e.g. information technology environment) and different environments (e.g. outpatients, wards and emergency room).

As indicated in section 3.3.2, some studies have examined the information needs of doctors in term of questioning behaviour context. Most of these and other studies described the information-seeking behaviour of doctors in terms of the process when doctors ask and get an answer for their clinical questions. This process was explained by Ely *et al.* (1999) who divided it into five stages: a) realizes uncertainty; b) formulates a question; c) pursues an answer to a question; d) finds an answer for a question; and e) applies the answer to patient care. The percentage of asking and answering clinical questions by doctors was different from one study to another (Gorman and Helfand 1995, Green, Ciampi and Ellis 2000, Seol *et al.* 2004, Ely *et al.* 2005, Coumou and Meijman 2006). Some of these studies indicated that doctors asked a large number of clinical questions when communicating with a patient for healthcare, many of which go unanswered. For instance, the literature review conducted by Coumou and Meijman (2006) found that primary care doctors seek answers to only a limited number of clinical questions. Similarly, the previous study conducted by Gorman and Helfand (1995) indicated that although primary care doctors generate many questions when they communicate with patients, they pursue only about 30% of them. Green, Ciampi and Ellis's (2000) study supports that and found that only 80 of a total of 277 questions identified by residents were pursued. González-González *et al.* (2007) investigated different patterns of primary care doctors' information seeking. They examined the most frequently asked questions by doctors and confirmed the sources most frequently used to answer them. The doctors asked a total of 635 questions. 84 (13.2%) of the questions were pursued after the consultation to seek for answers. Also, 61 (9.6%) were pursued

during the consultation and 490 (77.2%) of the questions were not pursued at all. Doctors found answers for the majority (75%-100%) of the pursued questions.

In contrast, some studies do not support the hypothesis that doctors generate many clinical questions but that a large number remain unanswered. Ramos, Linscheid and Schafer (2003) conducted a study in a university-based clinic in the USA. Direct observation of 13 faculty and 25 residents indicated 274 clinical questions were asked by participants over 215 patient encounters. The number of questions generated was different between the two groups. Residents generated 1.5 per encounter and the faculty generated 0.8 per encounter. Immediate answers to 66% of the total questions were sought by the two groups. They were satisfied with the answers to 87% of the questions and afterwards they pursued answers to only 6% of the remaining questions. Barrie and Ward (1997) used self-recording and semi-structured interviews to investigate the questioning behaviour of general practitioners. They found satisfactory answers to 67 (79%) of a total of 85 questions asked by doctors relating to patient care. Cheng's (2004) study used a triangulation research strategy (mailed questionnaire, interviews and randomised controlled study) to investigate the clinical questions posed by hospital clinicians (doctors, nurses and allied health professionals). The clinicians were asked if the problem or question that arose a week ago had been solved. They found that the most frequently asked questions occur when respondents want to decide on treatment, also when they were asked by colleagues and when they were diagnosing patients. The results showed that doctors have a higher percentage (77%) of success in solving problems than do other healthcare professions. The information-seeking of doctors has been examined in different context scenarios including outpatients departments, wards and emergency rooms. Covell, Uman and Manning (1985) found that only 30% of doctors' information needs had been met during the patient visit. Lappa (2005) indicated

that information seeking behaviour in the emergency department is critical due to the situation of the area and time constraints. The introduction of Information and Communication Technology (ICT) in the healthcare environment has opened up new ways of studying doctors' information-seeking and their use of different types of ICT resources (Casebeer *et al.* 2002, Magrabi *et al.* 2004, Boissin, Docsi and Bernard 2005, Bennett *et al.* 2006, Ranson *et al.* 2007 and Ajuwon 2006). Most of the studies have focused on the frequency of accessing and using ICT resources, the time doctors spend in searching online and the obstacles they may encounter when they search for the information they need.

It is obvious from the above arguments that seeking behaviour is context-oriented and there have been several debates raised by this subject. Tan *et al.* (2006) indicated that the process of information-seeking is context oriented and that it varies from one clinician to another and from ward to ward and that it required access to information sources. Spink and Cole (2001, p.45) stated that "information-seeking is a complex information and communication activity requiring access to diverse sources of information to deal with personal, social and work-related problems". Whether doctors pursue an answer or not to their clinical questions or problems, the literature shows that this attitude is articulated by seeking several kinds of clinical information sources. Thus the majority of the above-mentioned studies and other studies which have investigated the information needs and information-seeking of doctors, also investigated the various information-seeking channels or sources sought and used by doctors to pursue their questions or fulfil their needs. This will be the focus of the next section.

3.5 Clinical Information sources

3.5.1 Typology of clinical information sources

The review of the literature shows that doctors seek information from different sources. The types of information vary in terms of format, source and the purpose of the information need. These have been categorized in different ways by different researchers. Elayyan (1988) reviewed the literature on the use of information by physicians and categorized the information sources into two major types: *formal* or printed sources of information, including medical libraries, and *informal* or non-printed sources of information such as contact with colleagues, professional meetings, workshops and seminars, medical conferences, radio or television medical programs, pharmacists and correspondence as well as the courses offered by medical schools and government agencies. On the other hand, Gorman (1995) classified the information sources accessed by doctors into five groups: a) *Patient data*, including information on individuals taken from the patient's records, family, friends and self-reports; b) *Medical knowledge* obtained from generalized research and practice, from journals and textbooks; c) *Logistical information* from policies, procedures and from "getting the job done"; d) *Population statistics* such as aggregated data on many patients, recalled from memory or taken from public health reports and e) *Social influences*, including the patterns of local practice, as learned from talking with colleagues. Wood and Wright (1996) divided the information sources required by General Medical Practitioners into two broad areas: *internal sources* including reference books, GPs own reading, internal colleagues etc., and *external sources* including external colleagues, laboratory tests or results, hospital staff, medical records, library services and training courses. Covell,

Uman and Manning (1985) listed three sources of information used by doctors; a) *Print sources* such as general medical textbooks, specialty textbooks, pharmaceutical textbooks, journals, drug company information and self-made compendia. b) *Human sources* including specialists, generalists, office partners, pharmacists, nurses and other health professionals and c) *Other sources* such as laboratory data, patient response. Additionally, Ocheibi and Buba (2003) studied the library as an information source for doctors. They classified library resources into three information channels: the formal, semi-formal and informal. *Formal channels* include journal articles, reprints, handbooks, textbooks, reviews, conference proceedings, card catalogues, Selective Dissemination of Information (SDI) services, Current Awareness Services (CAS), audio-visual media, databases, bulletin board systems and email. *Informal channels* included the "Invisible College", private correspondence, local and foreign conferences, meetings and seminars. Lastly, *semi-formal channels* contained unpublished reports and theses, draft manuscripts, unpublished conference presentations, suppliers' catalogues and trade magazines.

All these sources of information have been examined by different researchers to determine the most used and sought by doctors and whether they have met their information needs. Also, the pros and cons of the impact of information sources on doctors' professional practice and changes in their information behaviour have been studied. The most common information sources sought by doctors and indicated in the literature were in the following areas.

3.5.2 Medical knowledge and experiences

Medical knowledge and experiences, both personal or from communicating with other professionals, is the source used most frequently by doctors for their medical practice, as confirmed by several studies. Wyatt (1991) points out that the main job of doctors is to meet the needs of patients by drawing on the knowledge accumulated by medicine over 5,000 years. Thompson (1997) in her study reviewed the literature of primary care doctors and the preferred characteristics of the information resources they used. She pointed out that doctors frequently rely on their medical knowledge built up over years of clinical experience and practice for patient care. Tan *et al.* (2006) indicated that experienced clinicians often refer to their personal experiences and knowledge for their medical practice, particularly in familiar clinical situations. Most of the studies focused on the medical knowledge acquired from communication with colleagues. This will be explained in the 'Interpersonal communication' sub-section in the next paragraph.

3.5.3 Interpersonal communication

Human resources occup ied a large area in the literature. The most common human resources used by doctors were their colleagues. Other human resources indicated, although not often, were communication with clinical librarians, patients and their relatives or friends. All these will be discussed in more detail below.

3.5.3.1 Communication with colleagues and consultants

Many studies indicate that doctors rely heavily on colleagues when they have information needs. The survey results of the study conducted by Dee and Blazek (1993)

found that nearly all rural doctors relied on their colleagues. Gorman (1995, p.729) said that "the heavy reliance of physicians on human sources of information has implications for the nature of their information needs, including the narrative structure of their knowledge and the need for more than information alone when solving clinical problems". This is supported by other previous studies which indicated that doctors rely on their colleagues more than using print and electronic resources (Marlow 1983, Stinson *et al.* 1980, Curley, Connelly, Rich 1990, Smith 1996 and Haug 1997). Covell, Uman and Manning's (1985) study demonstrated a contradiction in which a questionnaire survey showed that print sources were used frequently by doctors whilst the interview results indicated that 'asking colleagues' was the favourite source used. Bennett *et al* (2006) found that 41.3% of the 2,500 respondent doctors refer to their colleagues and read text when unsure about diagnostic and management issues for a complex case. This is supported by Tan *et al.* (2006) who found that clinicians use human, electronic and printed information sources to assist in providing patient care. However, where information is needed quickly, they preferred using experienced colleagues as the source of information. For example, the less experienced cancer practitioners refer to their senior medical staff for guidance.

Perley (2006) used a qualitative study to investigate doctors' practice of relying on curbside (i.e. kerbside) consultation. According to Keating, Zaslavsky and Ayanian's (1998, p. 901) study, curbside is defined as "the process in which a physician seeks information or advice about patient care from another physician who has a particular expertise without obtaining a formal consultation between the patient and the consultant physician at that time". Perley (2006) revealed that doctors used curbside consultation for several reasons including: to confirm what they already know; to get quick answers to a question related to diagnosis and/or treatment; to continue their education through

increasing their knowledge in the area of interest and as a good communication tool to help them to communicate with sub-specialists to negotiate for appropriate clinical action for a particular patient case. The literature review study performed by Coumou and Meijman (2006) stated that doctors seek answers to a small number of their clinical questions and when they do, they refer first to colleagues and paper sources. They stated that although the new developments in information technology, such as the Internet, facilitate doctors' access to a large body of electronic clinical information, this does not change the practice of doctors in seeking out information from their colleagues. The observation and self report method of data collection adopted by Romas, Linscheid and Schafers' (2003) study, indicated that most resident doctors used colleagues and pocket reference (handheld computer) to answer their clinical questions. Callen, Buyankhishig and McIntosh (2008) used a paper questionnaire to investigate the use of clinical information sources by hospital doctors in Mongolia. The results indicate that communication with colleagues was the most frequently used information source. The result indicated that asking colleagues has an impact on clinical decision-making.

While verbal communication with colleagues is a quick means of acquiring information, it should be viewed with caution. The early study conducted by Green (1978) stated that the value of colleagues as information sources is great, but that one needs to consider the limitations and pitfalls of depending on verbal interactions alone. Often, consultation fails to give the learner a real understanding of the related basic concepts. He also pointed out the dangers to which inaccurate and/or incomplete information can lead.

3.5.3.2 Professional meetings, seminars, workshops & conferences

The literature review shows another form of interpersonal communication by doctors, namely, through attending professional meetings, seminars and workshops. The survey study carried out by Nylenna and Aasland (2000), investigated the information-seeking behaviour of primary care doctors and compared this with hospital doctors' information-seeking behaviour. They found that courses, meetings and congresses were considered the most important continuing medical education activities for Norwegian doctors. Also, the traditional, formal, postgraduate courses offered by medical schools, hospitals, medical organizations and government agencies are a popular means for Continuing Medical Education (CME) for doctors. In addition, they found that primary care doctors spent less than three hours per week on medical reading, whereas hospital doctors spent 4.5 hours per week. In addition, although 59% of primary care doctors had access to the Internet for CME purposes, this figure rose to 76% for hospital doctors. Bigdeli (2004) conducted a study to investigate the information-seeking behaviour of specialists, residents and interns in the hospital of Ahvaz University of Medical Sciences in Iran. Most of the respondents obtain information from informal channels such as conferences to keep up-to-date with new information. In contrast, Bennett *et al.* (2004) investigated doctors' information-seeking behaviour in using the Internet. The survey results showed the degree of use of a range of information sources by doctors from 2001 to 2003. It was found that the importance of journals and local CME meetings had declined since 2001, and the importance of accessing electronic resources (e.g. video tape/CD-ROM and websites) for CME purpose, had increased. The study provided evidence of the use of Internet resources in doctors' medical practice.

3.5.3.3 Communication with patients

The literature review indicated two main reasons for doctors' communication with patients to meet their information needs. The first obvious reason was gathering patient history data from patients or patients' parents/relatives/friends. There is a shortage of literature that has examined doctors' information needs and other uses of patient data obtained from these sources. Thompson (1997) argued that several of the studies that have investigated the information needs of doctors excluded the need for patient data and focused more on the medical questions answered by general medical knowledge. This is corroborated by evidence from other published studies which have focused on exploring how doctors answered their clinical questions by obtaining clinical information from general medical knowledge sources such as the Internet, databases, print resources and asking colleagues. Obtaining patient data from communicating with the patient and their medical record was not investigated (Covell, Uman and Manning 1985, Green, Ciampi and Ellis 2000, Alper, White and Bin Ge 2005 and González-González *et al.* 2007).

Communications with patients have been recognised as a significant source of information for doctors. They increasingly recognize the importance of engaging patients in healthcare, particularly in making decisions regarding treatments that affect the patients' quality of life or require a choice between different therapies each with differing risks and benefits and generally assume that the patient and doctor reach agreement (Edwards and Elwyn 2001, and O'Donnell *et al.* 2006). Now the most common current models of medical decision-making are 'shared decision-making', 'informed decision-making' and 'evidence-based patient choice' (Whitney *et al.* 2008). All these models developed beyond shared decision-making with the patient. Whitney *et*

al. (2008, p.699) said that these models "portray an empowered patient actively involved in his/her medical choices and generally assume that patient and physicians reach agreement". As indicated in the literature, shared decision-making has been advocated for three main reasons, including that it reflects that the patient is a person and his/her opinions should be respected (Lo 2000 and Emanuel and Emanuel 1992). Another important reason is that clinical decisions should be consistent with patient value (Lo 2000) and sharing a decision with a patient will reflect positively on the healthcare service (Golin *et al.* 2002). Thus, doctors seek the appropriate sort of information from the patient to help them make clinical decisions. Murray *et al.* (2007) found that 780 (75%) of a total of 1,050 doctors preferred to share decision-making with their patients, 142 (14%) preferred paternalism (doctors keep their patients informed but, in general, make healthcare decisions for them on the basis of what they think is best) and 118 (11%) preferred consumerism (the doctor tells his/her patients and their families the options, and the pros and cons of each, and then they decide what to do). 87% of physicians perceived themselves as practising their preferred style. Physicians who preferred their patients to play an active role in decision-making were more likely to report encouraging patients to look for information and to report having enough time during consultations. There is a critical issue raised by Beaver and Booth (2007) about involving the patient in making an informed decision. Firstly, the healthcare professionals need to be aware of a patient's information need if they are to ensure that the patient is able to participate in making an informed decision. Secondly, the active role of a decision maker may not necessarily be suitable for all individuals. An individual preference assessment would ensure that a patient is only involved in the decision-making process to the extent with which they feel comfortable. The study conducted by Waston, Thomson and Murtagh (2008) of healthcare practitioners from five general practice surgeries in northern England; found that the implementation of a

situation where the patient shares in decision-making is helpful in practice. However, some obstacles were encountered including the lack of an evidence base and the short time available in consultations.

The above discussion shows some examples of the exchange of information between doctors, colleagues and patients. There are some studies in the literature that have indicated that doctors call for information from other professionals such as pharmacists and clinical librarians. More details about seeking information from other professionals are included in Sections: 3.5.4 and 3.5.5.

3.5.4 Hospital libraries and information centres

Some studies have focused on the use of resources and services available from hospital and health libraries. The research conducted by Pyne *et al.* (1999) indicated that the majority of clinicians in four NHS trusts in the North Thames area reported that they frequently visited libraries to keep up-to-date with current changes in their speciality. Urquhart and Hepworth (1996) used questionnaires, interviews and an analysis of search requests to assess the value of information supplied by the National Health Service (NHS) library and information services for clinical decision-making. They found that the information had significant effects on clinical decisions. Another study conducted by Ali (2000) indicated that 28% (80/288) of respondents (medical specialists) said that information provided by medical libraries contributed to a better quality of care. 23% mentioned that they definitely handled some aspects of clinical situations differently as a result of information provided by a medical library. 52% said that they probably handled some aspect of clinical situations differently and 54% stated that they identified

important changes to care. Cuddy (2005) examined the value of the Health Sciences Library at Fuld Campus in New Jersey. The result showed that it contributed to patient healthcare. This confirms and extends the outcomes of previous studies such as those of King (1987), Marshall (1992), Casado *et al* (1994) and Burton (1995).

In contrast, the study by Wood and Wright (1996) used 27 in-depth interviews with General Practitioners (GPs) in the Trent Health Region in the UK to explore the impact of information on clinical decision-making. The results showed that no use was made of external library services to assist in immediate patient care; the libraries were most used for looking for treatment for specific diseases, continuing education and research purposes. The survey study undertaken by Doney, Barlow and West (2005), assessed the use of libraries and electronic information resources by primary care staff (doctors and nurses) in Nottingham and Rotherham, UK. They reported low results for the use of libraries by General Practitioners and Practice Managers. However, Practice Nurses reported significantly higher usage. On the other hand, the use of the Internet was high - 81% of respondents. Although the doctors in Bellman *et al.* (2005) were satisfied with the quality of services provided by Kaiser Permanente (KP) medical libraries, they rarely or never use the KP medical libraries. The commonest reasons doctors indicated for this lack of use were time constraints and lack of skills in finding full-text articles. This is supported by the previous study conducted by Dee and Blazek (1993) which found that the medical library has little impact on rural doctors information-seeking behaviour. Most of them used it infrequently.

One of the new developments in the communication behaviour of doctors is the use of clinical librarians to assist them in meeting their information needs. Mullaly-Quijas, Ward and Woelfl (1994) found that health professionals see librarians as an essential

link in the information chain for a number of different reasons, particularly their expertise in searching, and knowledge of, MeSH terms. Booth, Sutton and Falzon (2002) evaluated the impact of information provided by clinical librarians on patient care. The study indicated that information provided by clinical librarians assisted, either significantly or moderately, in diagnosis (62%); in choice of intervention (85%); length of stay (29%); information given to patients (74%); future clinical decisions (94%) and better understanding of patients' conditions (94%). A new role has emerged for clinical librarians to act as 'Informationists'. Florance, Giuse and Ketchell, (2002, p.56) defined an Informationist as an information professional who "is cross-trained, which means information specialists who work as peers in clinical or research teams need basic knowledge about two fields - information and library sciences and discipline knowledge of scientific or clinical domains". Lappa (2005) indicated that clinical staff in the emergency department deal with a variety of cases yet, although needing information instantly in their place of work, have no time to visit the library. They believed that the clinical librarian could act as an informationist and help to facilitate access to high-quality information for the emergency department. Freeth and Smith (2003) evaluated the impact of the first post holder in the Clinical Effectiveness Librarian Service. The staff recognized the potential impact of the CEL's role on patient care. Harrison and Sargeant (2004) supported that and confirmed the need for the CLs to work with clinical colleagues in the clinical setting in the UK because there is a need to use evidence to improve patient care. Also, Brookman *et al.* (2006) evaluated the Clinical Librarian service at Brighton University Hospital in the UK. They found that the main uses for the searches by clinicians (consultants, registrars, nurses and pharmacists) were patient care and continuing professional development. In addition, the role of the CL was clear and it had the potential to enable clinicians to use the service to access a wider range of

resources and to save time. Users wanted the CL to act as part of the team and to include evaluative comments on the results.

3.5.5 Information and Communication Technologies (ICTs)

It was clear from the literature review that there is a great focus on studying the information-seeking of doctors in the context of the available technologies. Technology plays a significant role in the production, storage, processing, dissemination and exchanging of information. There is a range of technologies covered by the label 'ICT'. The more traditional forms include radio, press, television, film, walkie-talkies and telephones whilst the more advanced ones include email, CD-ROMs, websites, computers, mobile phones, Palm Pilots, digital video cameras and cell phones (Chetley 2001, and Curtain 2003). The use of ICTs in the healthcare environment is referred to by the term 'Telemedicine'. "Telemedicine is defined as the use of information technology and telecommunications to bridge geographical distances and improve healthcare delivery and education" (Demiris 2003, p.311). Another definition of Telemedicine is the use of information technology in the delivery of healthcare i.e. interactive audio, visual and data communications in healthcare diagnosis, treatment and education as well as in the transfer of medical data (CBR Staff Writer 2005). These technologies are mentioned regularly by doctors in studies of their information behaviour.

It was obvious from the literature that most of the early studies indicated the use of traditional and now outdated ICT resources by doctors for their medical practice. For instance, audiovisual materials were mentioned frequently by doctors as being used to solve clinical problems. Also, audiotapes became popular for doctors who were too busy

to leave their practice but had time to play a tape whilst travelling to and from work. The California Medical Association, for example, develops over 6,000 recordings each year in its Audio-Digest series in 1953. In addition, many pharmaceutical firms developed cassette-tape series for doctors to use at their offices, homes or in their cars (Leveridge 1975). Also, the study conducted by Short (1999) showed that many rural doctors who owned a computer felt that CD-ROM software helped them provide better patient care and kept them up to date with new information and techniques. However, the results of a study conducted by Lyon (1977) showed that tapes, slides and television presentations were not considered to be of much value for family doctors, who reported that these sources of information were more difficult to use because of the high cost of hardware and software systems, availability/accessibility was often difficult and they were not familiar with what is available or how to use that which is available. Marshal and Alexander (1977) pointed out that doctors tend to support the use of the radio and television as sources of information for reasons of ease of access and not having to travel great distances. The fact that there were no possibilities for dialogue among physicians at the time of the radio and television programmes was a negative factor. However, radio and television are good sources of information when used in combination with other sources such as group discussion or printed materials. The study of Khudair and Cook (2008) showed the low use of CD-ROM and OPAC for information searching by healthcare professionals, however, there were more who preferred to use the Internet. The literature shows the wide use of advanced ICT resources by doctors for their medical practice, such as the Internet, PDAs and electronic medical records.

3.5.5.1 Electronic patient medical records

The review of the literature indicated that doctors need specific information about patient data, such as history, from resources such as patient medical records (paper or electronic). According to Osheroff *et al.* (1991), about half of the information that a physicians needs to treat a patient can be answered from the medical record. Answers to the remaining 50% can be found equally from published sources or through a synthesis of the physician's existing knowledge and information from the patient.

In recent years, improvements in technology have enabled the development of electronic patient records. As the demand for healthcare information increases, electronic patient records become more affordable. The electronic patient records have been introduced to the healthcare environment as an essential tool to manage patient data (Shelley, Johnson and BeGole 2007). Jensen and Aanestad (2007, p.29) stated, "the term EPR is just one among many, which are depicted as a central technology in supporting the examination, treatment, and care of the patient". They listed the different names by which EPR has been known in the literature including: Computerised Patient Record; Electronic Patient Record; Electronic Health Record, Patient Care Information System; Electronic Medical Record and the Health Information System.

The reasons given for using electronic patient records by doctors was different from one study to another according to the progress of the system. Lærum, Ellingsen and Faxvaag (2001) examined the use of medical record systems by doctors in Norwegian hospitals. The result of the survey showed that the system was mainly used for reading patient data. Bernstein (2007, p.22) points out that Electronic Health Records function for "managing treatment most efficiently, monitoring patient compliance and treatment

regimes, and gaining easier access to real-time patient diagnostic information for better patient treatment". Jensen and Aanestad (2007) stated that doctors regard the EPR as an important tool to help in the documentation of patient information and allowing standard prescription procedures. Also, the study carried out by Sorby *et al.* (2005) showed that an EPR can be used by doctors for processing a discharge summary. The discharge summary form provides ideas for further treatment and follow-up of the patient when transferred from the hospital specialists to primary care. Hameed *et al.* (2008) found that an EPR helps doctors and nurses to manage patient data and assists them when making quick clinical decisions.

Despite the advantages to doctors of using an EPR, there were some disadvantages indicated in the literature. Margalit *et al.* (2006) examined the relationship between the extent of electronic medical record use and physician-patient communication. They found that Israeli primary care doctors spent almost one-quarter of the consultation gazing at the computer screen and using the keyboard. Gazing at a monitor appears to be particularly disruptive to psychosocial inquiry and emotional responsiveness, suggesting that visual attentiveness to the monitor rather than eye contact with the patient may inhibit sensitive doctor-patient dialogue.

3.5.5.2 Internet and databases

Using the technology of the Internet and online databases has been a popular choice for doctors. Since the early 1970s when the US National Library of Medicine started the MEDLINE service, the online searching of databases has become an accepted source of information among doctors (Elayyan 1988 and Tonukari 2005). The literature studies

indicate the frequency and reasons for doctors accessing the Internet and electronic resources.

Bowden, Kromer, and Rajia (1994) used questionnaires to assess doctors' information needs in five counties in Texas (Valley and Bexar counties). They found that information sources were used by doctors, particularly the MEDLINE database. The first reason for using the database was to search for information on patient care (27.9% respondents in Valley and 43.8% in Bexar) e.g. diagnosis, physical signs/symptoms, treatment, lab tests, drug information, referral and how to provide information to the patient. Owen and Fang (2003) investigated the behaviour of health professionals seeking information on complementary and alternative medicine. They found that 82% rated MEDLINE as a useful resource. Also, some results from previous studies have indicated that doctors have benefited from using the MEDLINE database (Chimoskey and Norris 1999, and Lindberg *et al.* 1993). The results of a survey-based study conducted by Bellman *et al.* (2005) on using online medical reference information, medical libraries and services, self-directed learning resources and continuing medical education by doctors, indicated that 74% of respondents needed information to inform a clinical decision for a specific patient, 63% to stay informed and update their clinical practice, 40% to educate patients and their families, 20% to train or inform other clinicians, 9% for research and 5% for education. The results also show that 41% of doctors reported the frequency of accessing online medical reference information was sometimes weekly. The most frequently mentioned location and time for accessing online medical reference information was at work during scheduled hours. Magrabi *et al.* (2005) determined when general practitioners used an online evidence system in their routine clinical practice. They found that 193 of the GPs used an online evidence system with the majority of them conducting 8.7 searches per month. The majority of the GPs

conducted their search from consulting rooms between 9 a.m. and 7 p.m. Searching for information-related diagnosis and treatment was the most frequent reason for searching an online evidence retrieval system. Another study investigating access to the Internet for patient care was the study conducted by Ajuwon (2006) in University College hospital in Nigeria, which also used the questionnaire method of data collection. The results showed that almost all of the respondents access the Internet. 90% of doctors searched information for patient care from the Internet, 76.2% of these used databases and the online databases searched most were MEDLINE and PubMed. A majority of doctors accessed the Internet from cyber cafes. The findings of the study conducted by Ur Rehman and Ramzy (2004b), which investigated the use of the Internet by health professionals at the health sciences centre (HSC) of Kuwait University, indicated that 92.1% of the respondents reported accessing the Internet from their office, whereas 73.2% of the respondents also accessed it from home. In addition, 28.3% of respondents used the HSC Library for accessing the Internet. The study also showed the frequency of accessing the Internet. 80.3% of the respondents used the Internet daily, 15% used it once a week and 2.5% used it once a month. The respondents indicated their reason for accessing the Internet: 88.2% of the respondents mentioned that the Internet provided better access to health sciences information, also 77.2% indicated that through the Internet they had better professional contacts and more than half of the respondents reported that the use of the Internet enabled them to access different channels of communication for their patient care and research. Bennett *et al.'s* (2006) study supported that and pointed out that the primary motivation of doctors to search for information over the Internet was to find information to assist in dealing with specific patient problems and the latest research findings. A study by Westbrook, Cosling and Coiera (2004, p.113) examined the use of online evidence by clinicians to support patient care. The results of the study indicated the heavy use of online evidence for

patient care, particularly when patients were admitted to the hospital. Their results supported the hypothesis that "clinicians' use of evidence is related to direct patient care"

In addition, the survey study by Bennett *et al.* (2004) found that doctors use the Internet to search for up-to-date research on specific topics. Therefore, continuing their professional development was an essential reason for looking for information. They showed that more than half of the doctors responding reported that they accessed the Internet for clinical information daily with 37.2% reporting weekly access. Around a quarter of respondents accessed the Internet monthly and few reported never using the Internet for clinical information. Also, the results demonstrated that the doctors seeking behaviour was affected by confidence and gender. They found that more than half of the doctors were confident in searching and less than half were very confident. A few reported that they lacked confidence in accessing the Internet. Males were more confident than females in accessing the Internet. Also, confidence in using the Internet for searching for medical information decreased as the number of years since graduation from medical school increased. Bellman *et al.* (2005) indicated that 89% of doctors frequently used online resources for several reasons: 74% for clinical decision-making, 63% to access up-to-date information and 40% to educate patients. A few used them for research projects and for education purposes. Casebeer *et al.*'s (2002) study found that most doctors used the Internet with 90% using it for electronic email and 86% for personal use. A few searched for specific patient information and consultation with colleagues. They indicated also the frequency of accessing Internet with only 8% of doctors accessing the Internet daily, 21% several times a week, 25% of doctors accessed it weekly, 26% monthly and 18% reported that they rarely accessed the Internet.

In contrast, some literature indicated the lower use of electronic resources by doctors for patient care. Renford (1982) found that American doctors infrequently used the MEDLARS system (database) of online retrieval. Pyne *et al.* (1999) indicated the use of library resources by clinicians in four Acute and Community Trusts in and around London. The results show high usage of paper resources such as journals and textbooks. However, access to electronic resources was problematic. Doney, Barlow and West's (2005) study in Nottingham and Rotherham in the UK showed that 81% of respondents (General Practitioners, Practice Nurses and Practice Managers) used the Internet but fewer than 44% reported using databases. GPs reported that they did not have enough time to use biomedical databases more frequently than other professional groups. Also, Bennett *et al.'s* (2006) study indicated that, even though doctors showed confidence and experienced few technical problems in searching for information on the Internet, only 9% of a total 2,500 doctors searched for information during a patient encounter. Also, Boissin and Docsi (2005) indicated that, although general practitioners in France were equipped with a computer and government policy is supposed to give GPs financial incentive to start using computers, most of them used their book collections, medical journals and colleagues for gathering information for their medical practice.

3.5.5.3 Mobile information resources

Mobile Cellphones and PDAs are two common features of telemedicine technology used by doctors for healthcare delivery. Barrett, Strayer and Schubart (2004, p.25) stated that:

"Healthcare professionals need information delivery tools for accessing information at the point of patient care. Personal digital assistants (PDAs), or hand-held devices demonstrate great promise as point-of-care information devices".

Ammenwerth *et al.* (2000) studied the mobile information tools available in hospitals. They pointed out that mobile information and communication systems had the potential to help significantly in the following: to improve communication, to enhance and facilitate information access and to reduce double documentation. By utilizing these tools the quality of patient care will increase in the clinical routine.

The literature shows that a PDA, which is a mobile technology tool, has been employed widely for various purposes by doctors in healthcare practice. The study by Barrett, Strayer and Schubart (2004) used quantitative (survey) and qualitative (interviews) methods to assess the use of personal digital assistants by doctors. The findings of the study showed that the majority of residents use PDAs daily and utilised them for commercial medical references and personal organization (e.g. calendars and address books). Garritty and Emam (2006) reviewed literature focusing on the use of a PDA by healthcare providers between 1993 and 2006. The key findings showed an increasing trend in using the PDA in healthcare settings among the healthcare individuals, primarily doctors who are younger and residents who work in large and hospital-based settings. The survey results of Garvin, Otto and McRae (2003) indicated that 88% of residents collected data on their hand-held computer, with 73% of them reporting daily use. The respondents reported the importance of using a hand-held computer to provide timely and useful procedure reports.

There is also evidence from the literature that the use of PDAs had an impact in clinical decision-making, patient education and teaching medical students (Torre and Wright 2003, Baumgart 2005 and Ranson *et al.* 2007). A study conducted by Dee, Teolis and Todd (2005) found that most of the doctors in selected American teaching hospitals used

PDAs for patient encounters (before, during and after a patient encounter). They also found that PDAs had an impact on doctors' clinical decision-making and treatment choice. Rothschild *et al.* (2002) found that PDAs assist doctors to frequently access evidence-based resources (e.g. drug database) and the PDAs had an impact on improving patient care. A similar result was indicated by the case study of Ranson *et al.* (2007) who found that all doctors accessed the PDA after training provided by the researcher to indicate the impact of the use of a PDA in doctors' clinical practice. The results showed that the benefits of accessing medical information by means of PDAs can be for more than just clinical decision-making. Other uses such as patient education and for teaching medical students have been added. Dorsey and Detlefsen's (2005) study revealed the usage of ICT sources by primary care doctors. All doctors reported using a computer, 92% reported they had Internet access in their clinical office setting and 50% used a PDA in the clinical setting. Lu *et al.* (2003) indicated that doctors frequently use PDAs in their routine work; in particular they often used ePocrates from their PDAs to obtain drug information. However, doctors used it less if the function required effort, e.g. debugging, cost, purchasing accessories and time spent learning to use functions or applications.

The literature review (1996-2008) study carried out by Lindguist *et al.* (2008) raised some critical issues. The results indicated that the most frequent reason for using PDAs was patient care and that the majority of healthcare users indicated in the literature were doctors. The use of PDAs in healthcare settings might improve decision-making, reduce the numbers of medical errors and enhance learning for both students and professionals. However, the authors argued that the evidence in the studies is not strong because most of the studies were descriptive and only 6 involved randomized controlled trials. Phua

and Lim (2008) used questionnaire methods of data collection to investigate the use of PDAs by residents and interns in a tertiary teaching hospital in Singapore. The results indicated that 40.3% of respondents had a PDA. The PDAs were used mostly for obtaining drug information, followed by medical references, scheduling and medical calculators. However, most of the respondents mentioned that they did not have medical software applications downloaded on their PDAs because they were worried about problems such as loss and breakage of the PDA. Thus, they prefer to use their desktop computer and paper.

The literature review provided scenarios involving the use of a cellphone in patient care. CBR Staff Writer (2005) found that three physicians at the University Hospital of Geneva, Switzerland, performed a three-month study to address the feasibility of taking images with cell phones. This involved taking two images of a leg ulcer, an overview image covering the lower leg and a close-up, and transmitting them via the mobile telephone to the e-mail accounts of two physicians who then made the remote diagnosis. According to the results, 82% of the participants felt comfortable making a diagnosis based on the pictures. Another study by Bunn, Byrne and Kendall (2005) examined the effect of telephone consultation on patient care. They found that telephone consultation decreased the number of patient visits to doctors and did not appear to increase visits to emergency departments. In addition, telephone consultation also appeared to be safe and people were just as satisfied using the telephone as going to see someone face-to-face. Also, the study conducted by Hallam (1993) into the nature of telephone contacts with patients explored the organizational strategies employed to minimize disruption to surgeries and indicated that the use of the telephone by patients to make contact with general practitioners has some advantages. In addition, the pros and cons of being accessible by telephone and the impact on the overall workload were also investigated

and recommendations for practices contemplating extending telephone access for patients were made.

3.5.6 Pharmaceutical representatives, pharmacists and drug literature

Some studies have indicated that doctors call for information from pharmaceutical representatives, pharmacists and drug literature. For example, early studies (Ferquson 1989 and Caplow 1982) indicated that doctors communicated with drug detailmen (pharmaceutical representatives) because they provided information about new products and made them aware of new information. In addition, some studies demonstrated the frequent use of the pharmacist as a source of information and confirmed a high degree of acceptance of pharmacists' recommendations concerning a patient's drug therapy (Byron *et al.* 1982 and Nelson *et al.* 1978). Boerkamp, Reuijl and Haaijer-Ruskamp (1997) stated that twenty years ago the pharmacist began to play a crucial role in the dissemination and evaluation of information about drugs to several groups of people including the general public, patients, doctors, nurses and other healthcare providers. A study by Wymer and Spiller (2002) showed that pharmaceutical representatives were the most useful source of information about medication used by doctors, followed by drug samples and adverts in medical journals. The study by González-González *et al.* (2007) supported this and showed that drug compendiums were the resources most frequently sought by primary care doctors for answers to their clinical questions in Spain. In addition, the study conducted by Matowe *et al.* (2006) investigated doctors' perceptions of pharmacists' professional practice in government hospitals in Kuwait. Many doctors considered the pharmacist a knowledgeable drug therapy expert. Two thirds of doctors reported that they communicated with a pharmacist at least once a week and the main

reasons were asking about drug availability (79%), alternatives (54%), side effects (25%) and drug interactions (18%).

In contrast, the literature showed that doctors are not depending on pharmacists for obtaining drug information as much as previously. The study of Boerkamp, Reuijl and Haaijer-Ruskamp (1997) evaluated the services provided by hospital pharmacists. They found that doctors perceived the sub-specialized doctors and supporting medical specialists to be the most important sources of information. However, the pharmacists were perceived as lacking in skill in particular areas such as the diagnosis of cases and the choice and implementation of therapy. Rajan *et al.* (2008) used a questionnaire survey as the data gathering method to explore the information-seeking behaviour of clinicians in a semi-urban township in Southern India. The findings of the study revealed that only 18% of respondents reported obtaining information from drug information centres. They pointed out that the information provided from pharmaceutical companies can be biased and inadequate. However, the results showed that clinicians rely more on textbooks and drug indexes to obtain information. There is less use of journals and the Internet for obtaining information.

3.5.7 Personal collections

The literature indicated that doctors rely heavily on their personal collections for their information needs. Bryant's (2004) study used three data-collection methods: case study, in-depth interviews and group discussions to investigate the information needs and information-seeking of family doctors working in the Aylesbury area of the UK. The results showed that the personal collection was the preferred source of information used

by doctors. This supported other previous findings. Dorsch (2000) reviewed the literature on the information needs of rural health professionals. They found that both rural and urban health practitioners need information for patient care. Both of the groups relied on two main sources: colleagues and personal libraries.

These personal collections can be electronic resources (Short 1999, Dorsey and Detlefsen 2005, Tenopir *et al.* 2007) or other resources such as printed materials (e.g. textbooks, dictionaries and drug literature). Printed materials, particularly medical textbooks and professional journals, represent an important source of personal printed information used by physicians in most previous studies. Haug (1997) reviewed 12 studies published between 1978 and 1992 by using a meta-analytical method. He found that consulting books and journals was the first choice source for doctors with the second being consulting colleagues. Dawes and Sampson (2003) analysed 19 studies to determine the information-seeking behaviour of physicians in different contexts. The Cochrane Library, MEDLINE and EMBASE were used to search for studies from 1966 to December 2001. They discovered that text sources were the most frequently used source of information by doctors followed by asking colleagues and only one study indicated the use of an electronic database. For example, Northup *et al.* (1983) indicated that medical books are the source of information used most frequently by physicians. Cogdill *et al.* (2000) found also that print resources are the primary source of information used by doctors in North Carolina for making diagnosis and drug therapy. Another supportive study was the interview results of Green, Ciampi and Ellis's (2000) which showed that of the (29%) of questions pursued by doctors, the most frequently used sources searched for an answer were textbooks (31%), original articles (21%) or attending doctors (17%). Ely *et al.'s* (2005) study showed the most common information resource reported by doctors to answer their clinical questions was medical textbooks

(31%) followed by informal consultations (18%). Also, the questionnaire results from the survey conducted by Ocheibi and Buba (2003) indicated that journals (37.3%) and books (19.0%) were the source used most by doctors in Nigerian hospitals. There was less use of electronic resources such as CD-ROM (3.2%).

In addition, as evidenced in section 3.5.5, doctors rely on their personal ICT resources (e.g. mobiles and PDAs) (Strayer and Schubart 2004, Garvin, Otto and McRae 2003). The study conducted by Short (1999) showed that many rural doctors who owned a computer and CD-ROM software reported that they used their personal collection for better patient care and to keep up to date with new information and techniques. In addition, Tenopir *et al.* (2007) indicated that paediatricians read heavily from personal journal (paper and electronic) subscriptions. They read for many purposes such as current awareness, treatment, diagnosis and for other reasons, such as preparing reports and presentations.

It is evident from the above literature that the reasons for using resources as recorded in the studies were different. Cimino *et al.* (2003, p.175) point out that "differences in resource use were related to context and user type". The literature review shows some factors doctors considered when they rely on the clinical information sources they seek out.

3.6 Criteria for using clinical information

When doctors seek information, there are certain criteria that they use in choosing clinical information for their medical practice. One of the important criteria shown in the

literature review is related to physical factors. Verhoeven, Boerma and Jong (1995) found that the most frequently used sources were those with good physical, functional and intellectual accessibility. However, some studies indicated that both physical and quality factors are important in choosing clinical information. Bennett *et al.* (2004) found that when doctors search for information on the Internet they assess the credibility, relevance, unlimited access, speed and ease of use because they intend their learning to be purposeful and goal-directed. Dawes and Sampson (2003) indicated that convenience of access, habit, reliability, high quality, speed of use and applicability make information-seeking likely to occur and be successful. In addition, Feather (2006, p.3) points out that information-searching skills are an important element in searching for information, but this is not the problem; the "issue lies rather in forming a judgment about the quality and value of what is found". Casebeer *et al.* (2002) indicated that doctors used the Internet because it was quick, provided 24-hour access to information, and was easy to search.

Another factor which encourages the use of clinical information is seeking the best evidence for clinical practice, which also reflects the use of quality as an information factor. The State Health Department of New South Wales in Australia developed the Clinical Information Access Program (CIAP) to encourage evidence-based practice among clinicians. This program provides 55,000 clinicians with access to many bibliographic and other clinical information resources (Gosling, Westbrook and Coiera 2003). Gosling, Westbrook and Coiera (2003) examined the factors affecting differences in clinicians' (doctors, nurses and allied heath professionals) use of an online evidence retrieval system. Three methods of data collection were used including: web-log analysis, focus groups and interviews with 61 staff from three public hospitals in New South Wales, Australia. The results show that doctors used the CIAP for answering

queries related to a patient's diagnosis and treatment. This was driven by a belief in the need for best evidence to support clinical practice. Further studies were conducted also by Westbrook, Gosling and Coiera (2004, p.113) to test two hypotheses: "a) clinicians use online evidence primarily to support clinical decisions relating to direct patient care; and b) clinicians use online evidence predominantly for research and continuing education." The results supported the hypothesis that clinicians were likely to use evidence to support patient care. Magrabi *et al.* (2004) found that the use of an online evidence system in routine clinical practice had the effect of improving clinicians' patient care. Johanson and Lucking (2001) used the questionnaire research method to investigate the support for the principle of evidence-based medicine (EBM) with a range of obstetricians and gynaecologists. They found that most clinicians had access to electronic databases and used guidelines and audits for patient care. This result provided broad support for EBM. In addition, Zack *et al.* (2006) indicated that general practitioners, when searching tertiary knowledge resources, chose authoritative, accessible and relevant information. In contrast, Wyatt *et al.* (1998) evaluated the impact of an educational visit to help obstetricians and midwives select and use evidence from a Cochrane database containing 600 systematic reviews. They indicated that doctors do not regularly use the available evidence to support their clinical decision-making.

3.7 Barriers to obtaining information

Despite the existence of many resources which can provide doctors with information, there are certain difficulties impeding them seeking the information they need when they communicate with the patient. Some of these problems refer to environmental factors. Tan *et al.* (2006) investigated the obstacles to using online cancer information by cancer

clinicians in New South Wales. The environmental barriers reported by doctors were: limits on the number of computers in their organisation, for example, the computers available in the outpatients area and on the wards were used only for clinical purposes; the available computers were old and slow and not connected to printers; the slow speed of Internet and Intranet connections and inaccessibility of information sources through the Internet. In addition, access to the Internet was available to selected staff members only.

Another major obstacle indicated in a large number of previous studies is time constraints. This was a major problem relating to the use of information technology. Many studies have indicated that doctors reported a lack of time to search online for information (Dawes and Sampson 2003, Andrews *et al.* 2005, D'Alessandro *et al.* 2004, Green and Ruff 2005). Coumou and Meijman (2006) mentioned that the time taken to search for information is the major obstacle and the other difficulties are formulating an appropriate search question, finding an optimal search strategy and interpreting the evidence found. Also the study by Dawes and Sampson (2003) revealed that the lack of time to search, the huge amount of material, forgetfulness, the belief that there is likely to be no answer and a lack of urgency all hindered the seeking-behaviour. This implies a need for further categorization of information need and information sources. Another factor associated with time constraints was the organisational setting and situation. Hospital doctors are very busy people. They are usually placed in situations which require urgent information in a limited time. This was highlighted in the study by Lappa (2005) who indicated that clinical staff in the emergency department dealt with a variety of cases yet, needing information instantly in their place of work, had no time to visit the library. This is also supported by Tan *et al.* (2006) who stated that time constraints were a significant barrier in the hospital work setting, where the use of online resources was

limited to routine care. Lack of time during working hours was one of problems investigated in Bellman *et al.*'s (2005) study. In addition, Covell, Uman and Manning's (1985) questionnaire results showed the most common problems indicated by doctors seeking answers to clinical questions. 18 doctors reported were waiting for laboratory test results or a patient's response to therapy; 9 doctors were waiting for second opinions from specialists and 11 did not know the appropriate source of information. The interview results indicated that the problems most frequently reported by doctors were a lack of time to look for information, cost, disorganization and a lack of sources. Also, doctors in Ajuwon's (2006) study indicated many problems in using the Internet such as the slow connection speed, lack of information-searching skills, cost and information overload.

There are also some obstacles mentioned in the literature relating to user problems. The lack of IT skills and lack of ability to assess websites for the information needed was a user barrier indicated in Tan *et al.*'s (2006) study. This finding supports those of other previous studies such as those by O'Connor (2002), Dorsch and Pifalo (1997) and Ur Rehman and Ramzy (2004b) who all found that a lack of IT skills and confidence in using IT resources were the most frequent problems revealed by doctors which impeded their information-seeking behaviour. Doney, Barlow and West (2005) found that the lack of training in using the Internet (74%) and biomedical databases (62%) were the most frequently reported problems by general practitioners. Lack of awareness of the availability of resources in the Kaiser Permanente Library was also another user problem indicated by Bellman *et al.* (2005). In addition, resistance to change and reluctance to accept new technology, such as Electronic Medical Records, were other problems that prevented doctors seeking the information they need (Retchin and Wenzel 1999 and Schleyer 2004)

In addition, some difficulties, such as information overload, result from the use of information technologies. Dawes and Sampson (2003) for example, indicated that a lack of time to search and the huge amount of information available hindered doctors' information-seeking behaviour. Bennett *et al.* (2006) identified some barriers to doctors answering clinical questions by using the Internet including a lack of specific information, too much information to scan, difficulty downloading information, slow speeds and software incompatibilities. Casebeer *et al's* (2002) study, found that the most frequently reported problems by doctors were the huge amount of information to scan and the lack of specific information. Also, another information factor affecting doctors' information-seeking is that finding resources that are trustworthy and evidence-based is the priority when doctors are seeking information. Cheng (2004) indicated that questions or problems arise frequently in situations when clinicians need to decide on a treatment, to answer colleagues and to diagnose patients, and the most necessary information in that situation was clinical research evidence and clinical guidelines or protocols. Also, Boissin and Docsi (2005, p.173) found that doctors lacked the skills to use the new information tools in a proper way. Also, the computers were underused for searching clinical information. The impression that Internet sources of information are thought to be unreliable concerned some doctors. The high cost of online resources subscriptions was another factor hindering doctors' information-seeking behaviour according to Tan *et al.'s* (2006) study. Cost was the second most problematic barrier to ICT use in Covell, Uman and Manning's (1985) study.

Ely *et al.* (2002, p.324) indicated 59 obstacles encountered by doctors when they seek answers to their clinical questions for patient care. They organised the barriers in the asking and answering process into five steps: a) recognize a gap in knowledge, b) formulate the question, c) search for relevant information, d) formulate an answer and e)

use the answer to direct patient care. There were six barriers considered. Firstly, doctors said it was time-consuming to find the information they needed. Secondly, they had trouble in modifying the original question, which was frequently unclear and open to interpretation. Thirdly, a lack of searching skills, such as difficulty in selecting an optimal search strategy for searching for information, was mentioned. Fourthly, problems in finding resources related to the topic interest. Moreover, they experienced uncertainty about how they arrive at relevant evidence and felt that the search could end in an inadequate synthesis of multiple bits of evidence into a clinically useful statement. On the other hand, Cheng (2004, p.445) rejects the hypothesis that "building well-structured and complete questions or statements did not mean higher successes rates in problem solving or higher satisfaction with obtained information"

It is evident from the above discussion that information needs and seeking are a contextual process. Many concepts and issues are related and linked to this topic. Thus many models were investigated and will be considered in the next section.

3.8 Utilization of conceptual models in information-seeking behaviour

3.8.1 The concept of models

Generally, Social Scientists and other professionals such as those in Health Informatics use models such as conceptual models to represent certain aspects of the real world in a systematic way. A model may be described as a framework for thinking about problems and may evolve into a statement of the relationships among theoretical propositions (Wilson 1999). Frequently, models are defined in relation to theories. A theory is

defined as "a set of related statements that explain, describe or predict phenomena in a given context" (Case 2007, p.120). According to Järvelin and Wilson (2003), conceptual models are broader and more fundamental than scientific theories in that they set the preconditions of theory formulation. Indeed, they provide the conceptual and methodological tools for formulating hypotheses and theories.

An early study by Engelbart (1962) said that developing conceptual models means identifying the essential objects or components of the system, the relationships of the objects in the system, the kinds of changes in the objects or their relationships that affect the functioning of the system - and how - and the promising goals and methods of research. Models of information-seeking are described by Wilson (1999, p.250) as:

"A model may be described as a framework for thinking about a problem and may evolve into a statement of the relationships among theoretical propositions. Most models in the general field of information behaviour are of the former variety: they are statements, often in the form of a diagram, that attempt to describe an information-seeking activity, the causes and consequences of activity, or the relationships among stages in information-seeking behaviour".

In addition, Wilson (1997, p.551) emphasized three elements which should be included in information behaviour models:

- "Information need and its drivers, i.e., the factors that give rise to an individual's perception of need;

- The factors that affect the individual's response to the perception of need; and

- The processes or actions involved in that response".

As evidenced in Section 3.2.1, many models of information-seeking have existed since 1966. In this research, seven particular models are reviewed. The reasons for choosing these models and the description of each model are the core debate in the following sections.

3.8.2 Examples of information-seeking models

Several kinds of models have evolved in information-seeking behaviour research to serve different purposes. Some examples of particular models are discussed in this section for various reasons. Firstly, they are the most cited general models, for example Wilson (1999) used Ellis's 1989 model and Kulthau's 1991 model. Secondly, the models indicate something about information needs and sources which are the main subjects of this research. Thirdly, the models emphasise the seeking behaviour related to the task, discipline or job. This serves the objective of focusing on the study of the information needs and seeking strategies of a specific profession: in this case 'doctors'. Fourthly, these models are general and applicable in multiple contexts, occupations, roles and knowledge domains For example, Wilson's 1996 model has been used in information seeking behaviour studies to develop a conceptual framework for the research, such as the exploratory study conducted by Ford, Miller and Moss (2005) to investigate the effects of human individual differences on Web search strategy. Also, Al-Daihani (2003) investigated the information behaviour of Kuwaiti legal professionals, using Wilson's model. Landry (2006) utilised Leckie's model to investigate the information seeking behaviour of dentists. Finally, the models reviewed in this study were developed by information professionals and by health informatics professionals, which means that they look for different perspectives. This research explores the information-seeking

behaviour of doctors in different scenarios, thus discussing models that focus on doctors-patient communication will be ideal to achieve the objectives of the research.

Consequently, the models considered in this research are those of Wilson; Leckie; Ellis; Bauchner, Simpson and Chessare; and Elson, Faughnan and Connelly.

3.8.2.1 Wilson's models

A series of models of information-seeking behaviours was developed by Wilson. However, only the 1981 model and its 1996 modification are discussed to see how Wilson's information-seeking behaviour theory evolved and how it can be improved.

Wilson's 1981 model

The process of information-seeking behaviour in this model (Figure 3.1) consists of 12 elements starting with the 'information user'. The information arises when the user has a need and has to satisfy it. Several features of behaviours are created by the user. For instance, the user may create demands upon sources of information or information systems. On the other hand, the user may seek information from other people, rather than from systems, and this is expressed in the diagram as involving 'information exchange'. The results of these demands lead either to success, in which case the information is 'used', or to failure, which is presumed to be a dead end, as information that is not 'found' cannot be used. It is odd, however, that 'failure' of 'demands on the other information sources' are not depicted as directly feeding back to 'need' by way of another arrow (Wilson 1999, Case 2007).
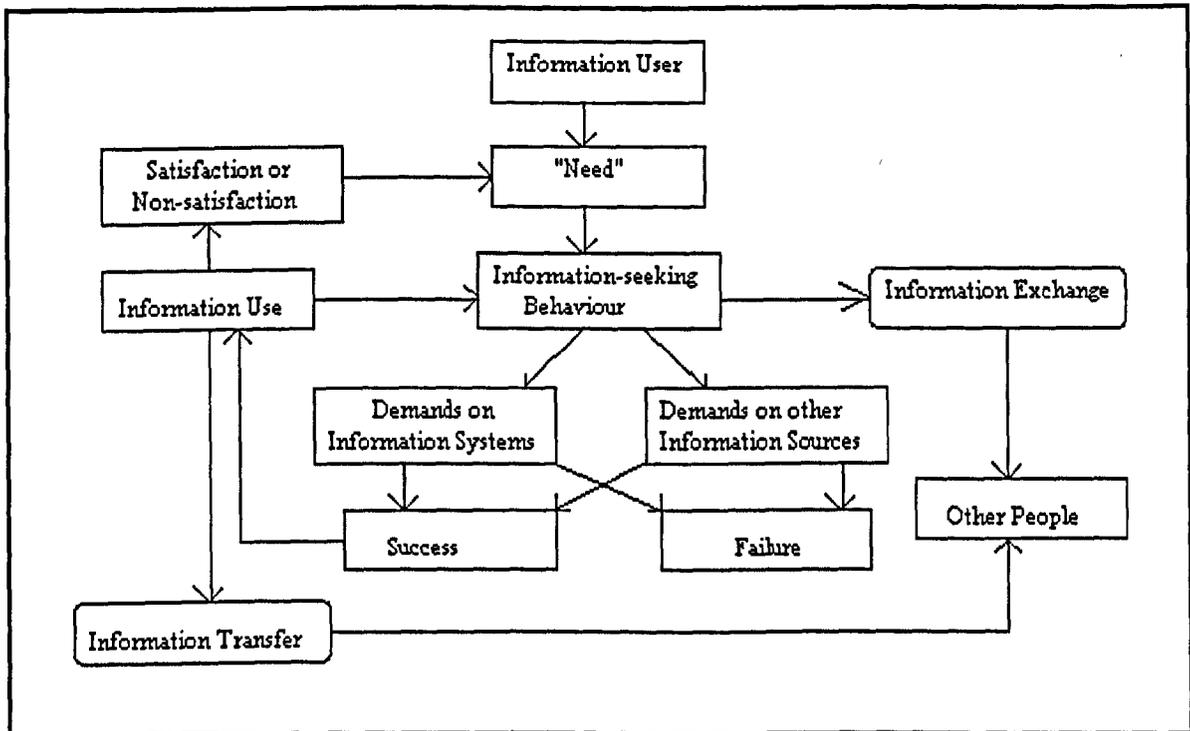
Figure 3.1: An outline of Wilson's 1981 model of information-seeking behaviour (Wilson 1999)

Wilson (1999) pointed to some limitations of this model. The model shows the information-seeking as a linear process consisting of various stages and draws attention to gaps in research. The model is limited and provides no suggestions for the casual factors in information behaviour and therefore it does not refer directly to the hypotheses to be tested. Case (2007) argued that Wilson's 1981 model addressed the results of seeking as 'success' or 'failure', and the degree of the satisfaction of a need. However, it does not take into account questions of source characteristics and personal preferences among them.

Wilson's 1999 model

The second of Wilson's models is based on the 1981 model (Figure 3.2) but is more complex. This revision was based on an extensive review of the research in a variety of areas other than information science, including decision-making, psychology,

innovation, health communication and consumer research (Ingwersen and Jarvelin 2005). In this model Wilson emphasizes the complex context of information-seeking.
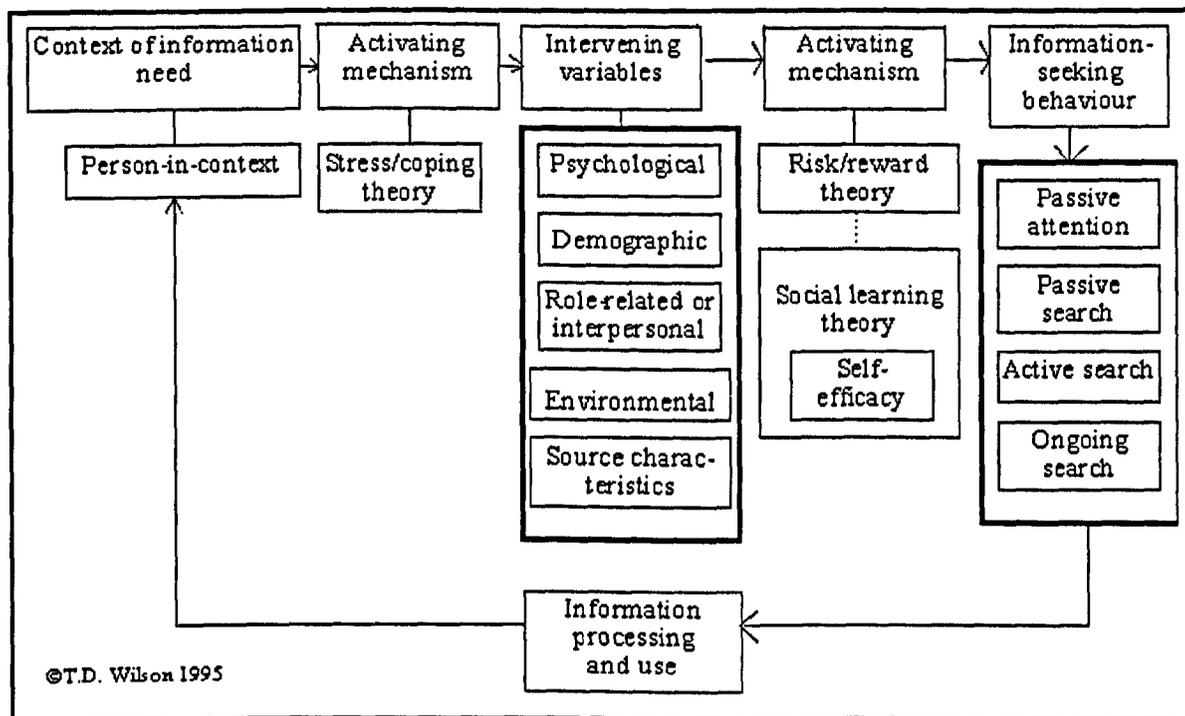
Figure 3.2: An outline of Wilson's 1996 model of information behaviour (Wilson 1999)

Gaslikove (1999, p.2) described the context of information-seeking as follows:

> *"the context of information-seeking may be described by means of many different parameters such as the time and place of appearance of information need, the time for information seeking, types of participants in the seeking process, for example, their demographic, social, professional, education and behavioural characteristics, the purpose of information seeking, the concrete task for which this information is looked for, the process and situations of information-seeking and many others"*

In this model Wilson came to the view that information-seeking arises in context and contains a variety of methods, including passive attention. Then the information is processed and used which provides a necessary feedback circle when the needs are satisfied (Wilson 1999 and Ingwersen and Jarvelin 2005).

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Wilson (1999) argued that the person in context is the focus of the information needs, and intervening variables such as the psychological, demographic, role-related or interpersonal, environmental and source characteristics, can support or hinder the information use. In this model he identified three theoretical aspects of information-seeking that could act as "activating mechanisms" in the user context:

- "Stress/coping theory explains why some needs prompt information-seeking more so than others.

- Risk/reward theory explains why some information sources may be used more than others.

- Social learning theories involve the concept of 'self-efficacy', which explains why some people may or may not pursue a goal successfully, based on their perceptions of their own efficacy" (Case 2007, p.136).

Another important aspect in this model is that Wilson identified four different phases of obtaining information. The first phase is *passive attention*. This method refers to the situation when an individual acquires information from the environment with no previous intention of obtaining that information, for example, listening to the radio and watching television, reading newspapers and journals and communicating with colleagues. The second mode, called *passive search*, applies to cases where a certain type of information behaviour leads to accessing information that is relevant to the individual's need, e.g. browsing. The third mode named *active search* occurs when an individual seeks out information actively from different sources (e.g. libraries, electronic databases and personal collections). The fourth is the *ongoing search method*, which takes place when the individual already has a large amount of knowledge in a specific

area, but carries out a continuing search to keep up-to-date and/or expand his/her knowledge in that area (Wilson 1999, p.256 and Niedźwiedzka 2003).

The model also described the process of information processing and use behaviour. The information that has been obtained by the individual is then processed. The information will become an item of knowledge and the individual may use it directly or indirectly to influence the environment and as a result, create new information needs. In this model the information activities (mental and physical) work in a cyclic process in which the different elements of the context influence and control the person's behaviour at all stages and where the information obtained becomes a new element in a dynamic system (Niedźwiedzka 2003).

3.8.2.2 The Ellis (1989) and Ellis, Cox & Hall (1993) models

These researchers proposed and elaborated a general model of the information-seeking behaviour of academic social scientists, aimed to help in the development of an information retrieval system that might be of more general interest for the information studies field (Ellis 2006). The original model has been utilised and extended in studies of the information-seeking patterns of social scientists, physicists, chemists and engineers (Ellis 2006). Further research was conducted by Ellis using semi-structured interviews as the data gathering method and Strauss's Grounded Theory for data analysis (Meho and Tibbo 2003). The outcome of the research indicated that the different behaviours consist of the following basic features (Figure 3.3):
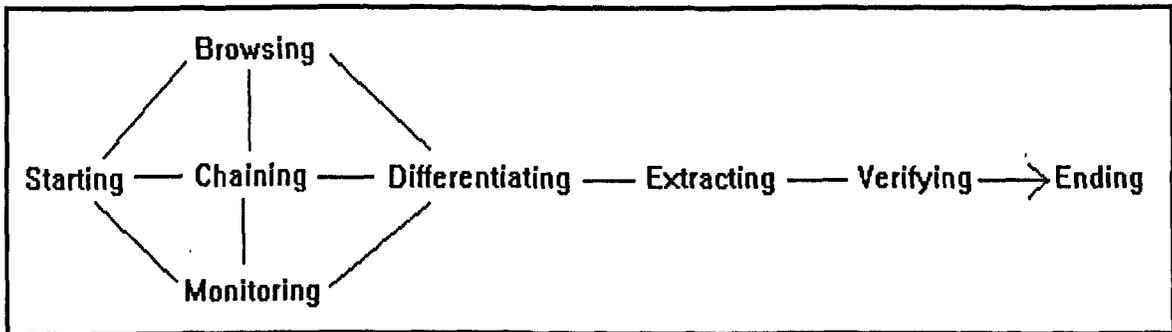
Figure 3.3: The outline of a process model based on Ellis's 'characteristics'

- *Starting*: This activity includes the features of the initial search for information, for instance when the user starts seeking information he/she determines an initial reference as a starting point (e.g. asking a knowledgeable colleague, online catalogues and abstracts and indexes). These references include sources that the user is familiar with as well as those which are expected to supply relevant information (Ellis 2006, Meho and Tibbo 2003);

- *Chaining*: This activity refers to when users follow chains of citation and footnotes or other forms of referential connections between materials during the 'starting' phase. In this activity, the user can be 'backward' when references from initial sources are followed, or 'forward' by following up other sources from known items (i.e. citation researching) (Ellis 2006, Meho and Tibbo 2003);

- *Browsing*: This activity refers to searching for information in the areas of potential interest. It includes scanning published journals and tables of contents, in addition it includes references and abstracts and printouts from retrospective literature searches (Ellis 2006, Meho and Tibbo 2003).

- *Differentiating*: refers to activities using known differences (e.g. author and journal hierarchies or nature and quality of information) between information

sources as a way to filter and select the amount of information obtained (Ellis 2006, Meho and Tibbo 2003);

- *Monitoring:* the user in this activity keeps abreast of new developments in an area by regularly following particular sources e.g. core journals, newspapers, conferences, books and magazines (Ellis 2006, Meho and Tibbo 2003);

- *Extracting:* this activity includes going through particular sources and identifying relevant material in an information source e.g. a set of journals and computer databases (Ellis 2006, Meho and Tibbo 2003);

- *Verifying:* this feature is characterised by the activity of checking the accuracy of information found by users (Wilson 1999);

- *Ending:* this is characterized by activities typically associated with the conclusion of the information-seeking, such as building final summaries and organizing notes (Wilson 1999).

3.8.2.3 Leckie's 1996 model

Leckie's model (Figure 3.4) is based on the assumption that information-seeking is related to the enactment of a particular role and its associated tasks. As part of the communication and information-seeking process, professional groups, such as engineers, healthcare professionals and lawyers, adopt, enact, and expect various roles (Kerins, Madden and Fulton 2004).
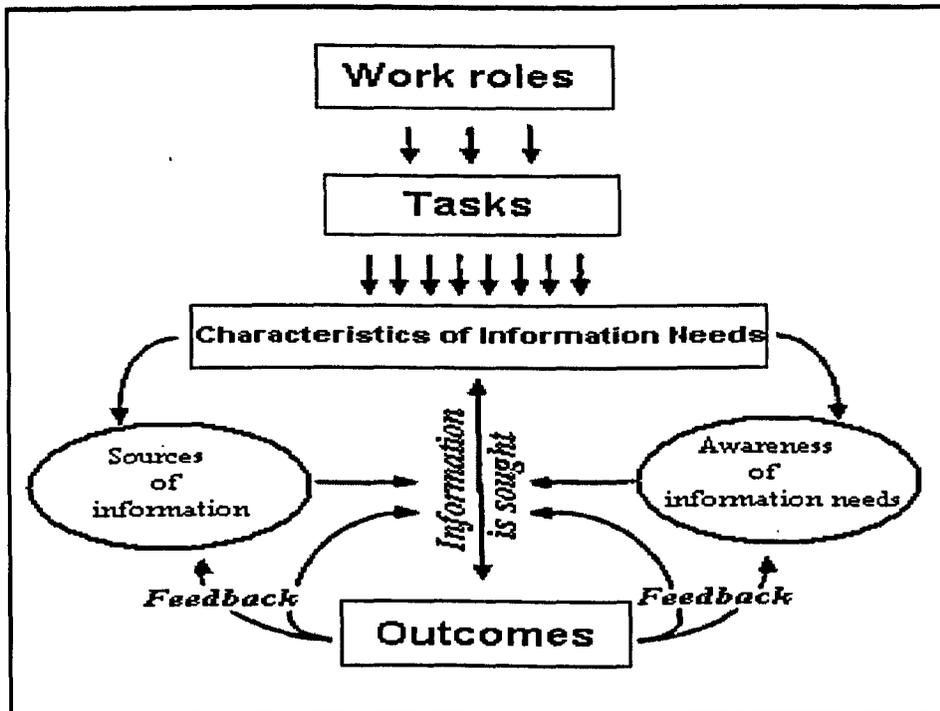
Figure 3.4: The Information-seeking of Professionals model. (Leckie *et al.* 1996)

The model has the following major components:

- *Work roles*: the model is restricted to professionals such managers, researchers, doctors, lawyers etc. Thus, the work roles stimulate the seeking.

- *Tasks*: A work role consists of particular tasks, for example, assessment, counselling and supervising. Both the work role and tasks are primary motivators for seeking information (Case 2007).

- *Characteristics of information needs*. There are some variables that influence or shape the information need including individual demographics (age, profession, specialization, career stage, geographic location), context (situation specific need, internally or externally prompted); frequency (recurring need or new); predictability (anticipated need or unexpected); importance (degree of urgency); and complexity (easily resolved or difficult) (Leckie, Pettigrew and Sylvain 1996 and Case 2007).

- The model demonstrates that when the information-seeking process starts, there are some factors that affect the success or failure of the search. These factors were identified as:

- *Sources of information.* These involve all the potential sources of information available, for example, colleagues, libraries, handbooks, journal articles, own personal knowledge and experience. These sources can be of different types or formats such as: formal sources (conferences, journals, libraries); informal (conversation with colleagues); internal and external sources; oral and written; and personal (own knowledge and experience, professional practices).

- *Awareness of information.* This element refers to whether an individual had some knowledge of those sources and their benefits. Other factors include trustworthiness (reliability or helpfulness); timeliness (found when needed); cost-effectiveness; quality (level of detail, accuracy, etc) and accessibility (relative ease of access).

- *Outcomes*: The end result of the information-seeking process refers to the outcome. It has two modes, either moving the work forward, such as the provision of services, or, if the need is not satisfied, a second round of information-seeking is typically undertaken for greater clarification. In this second round, it is likely that a completely different mix of sources and awareness factors will be involved (Leckie, Pettigrew and Sylvain 19 96 and Leckie 2006).

3.8.2.4 The Bauchner, Simpson and Chessare (2001) model

Bauchner, Simpson and Chessare (2001) discussed the model of clinical decision-making shown in Figure 3.5. They stated that clinical decision-making could be

described by the three overlapping domains pointed out by Bauchner and Wise's (2000) study. They emphasized the importance of understanding the process of how doctors make clinical decisions, which will help in enhancing the appropriate delivery of effective health services. They indicated that clinical decisions are sometimes made in the context of societal norms. For example, in the society of USA, when doctors face the scenario of reviving an infant who weighs 580 grams at birth, the societal norm suggests that he or she should do so. This clinical decision may be different in another country. Another example is that in the UK, there is little consensus that healthy children receive the varicella vaccine. All these examples show that societal norms will dominate doctors' decision-making. In addition, they added three other domains influencing clinical decision-making including: doctors' experience and knowledge; patient characteristics and values and external clinical evidence.
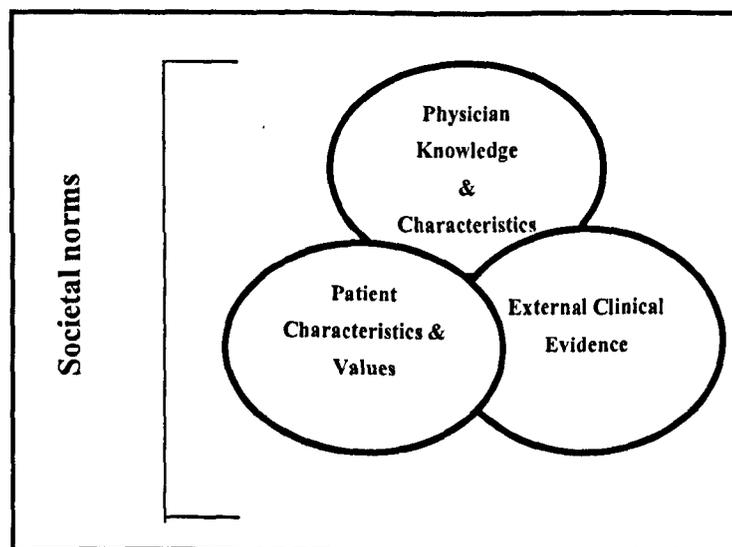
Figure 3.5: Model of Clinical Decision-making

These domains are affected by other factors. For example, the patient's characteristics and values can be influenced by culture and ethnicity factors in terms of health behaviours (e.g. diet) and health beliefs, values and preferences. Another example, the

availability of valid and reliable guidelines, may encourage the use of external clinical evidence.

This model is dynamic, each domain is not static and it is changing according to the clinical decision being made (see Figure 3.6). For instance, in an urgent or acute condition, there is less participation by the patient or their family in the decision-making. So the patient characteristics domain is fairly small. However, the patient characteristics can be more dominant in a scenario where there is a sharing of opinion with the patient about drug prescribing and treatment therapy.
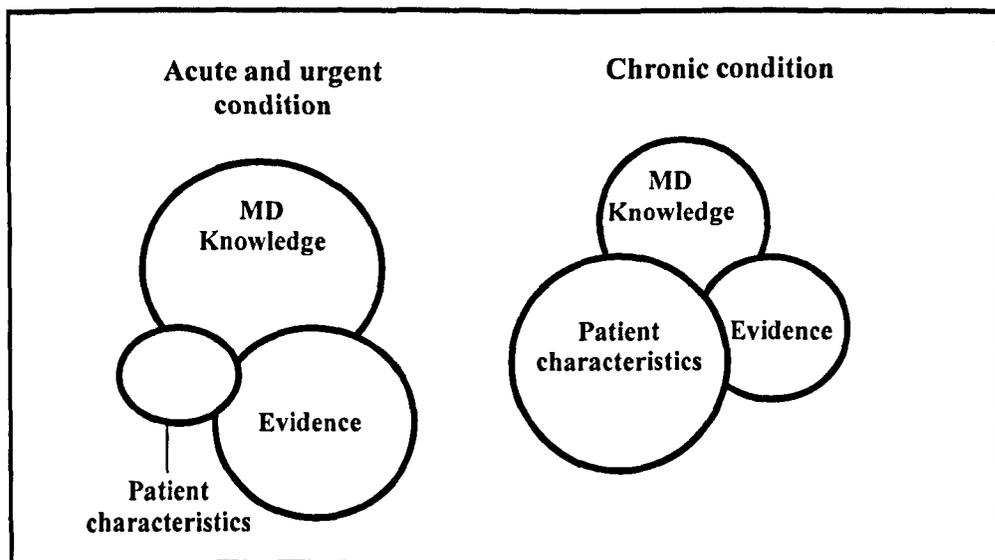
Figure 3.6: Model of clinical decision-making

Bauchiner, Simpson and Chessare (2001, p.460) stated that:

> *"The pharmaceutical industry understands that for many physicians' decisions, particularly drug prescribing, the patient can influence physician behaviour".*

3.8.2.5 The Elson, Faughnan and Connelly Model (1997)

Newell and Simon (1972) developed a general model for human decision maker information processing. Elson, Faughnan and Connelly (1997) utilized the model in the

context of doctors' clinical decision-making, as shown in figure 3.7. They believed that the clinical decision-making is driven by information from patient data and clinical knowledge. This information is used in most current systems; however, it encounters high failure that is perhaps due to some limitations. Thus, they used an industrial process model of clinical decision-making to illustrate the role of these limitations in increasing the variability in the delivery of relevant clinical knowledge and patient data to decision-making clinicians (Elson, Faughnan and Connelly 1997). They pointed out that in situations where incomplete data is combined with the limitations and variability of human memory and cognitive processing, high variability in decision outcomes is the expected outcome.
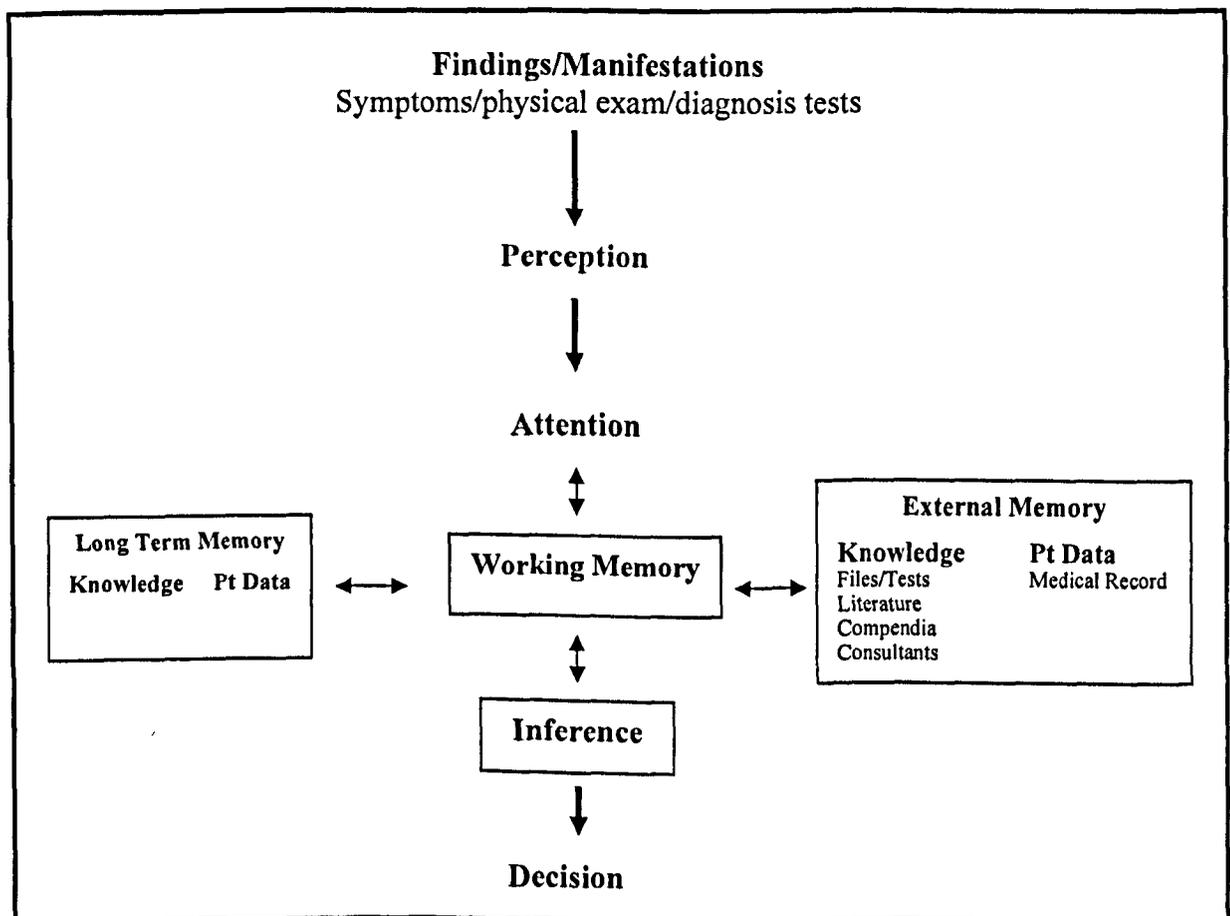
Figure 3.7: Elson, Faughnan and Connelly model (1997, p.267).

The models start with the doctor first considering the available clinical information, for example information from presenting complaints, medical history, physical examination and laboratory findings. Then this information will be combined with medical domain knowledge stored in the doctor's personal memory or available in some form of "external" memory, for example information in reference texts, journal articles and personal compendia. Subsequently, inferences are made that lead to decisions or conclusions (Elson, Faughnan and Connelly 1997). They stated that "The model's representation of inference as an undefined process also fits nicely with the present focus, which is the supply of information to support inference rather than inference itself" (Elson, Faughnan and Connelly 1997, p. 267).

In brief, all six models are useful and general. They describe different contexts of information-seeking, which means identifying many different factors such as user characteristics, the time available for seeking information, the reason for seeking information and the processes, sources and situations of information-seeking. Exploring information needs and information-seeking by health professionals, particularly doctors, is the context of information-seeking in this research.

3.9 Summary

This chapter provides a contextual review of the different aspects of the research problem including a brief historical background of user studies and related concepts and models. It reviews and describes these issues in the healthcare context, focusing particularly on doctors, who are the subject of the research problem.

It is evident from the review of the literature that doctors, as any other professional group, need information for several purposes, including for clinical decision-making, to keep abreast of current information; information needed for professional development and the information needs for human information exchanging. This information may be articulated as the behaviour of seeking different information resources. The literature demonstrates that the information-seeking of doctors is context oriented. It is different from one scenario to another and from one situation to another one. The literature review shows that doctors obtain information from different clinical information resources which can be categorized as different formats: print, electronic resources and interpersonal communication (e.g. asking colleagues).

However, the doctors' information-seeking process is affected by contextual factors such as organizational constraints, time constraints, availability, the accessibility of sources and the reliability of information. Although previous studies have highlighted several contextual factors in doctors' information needs and seeking, the study presented here will expand our knowledge of doctors' information-seeking behaviour by identifying other contextual factors which have not been covered in the literature so far reviewed, by exploring the information needs and seeking of doctors working in the Kuwait government hospital setting. Also, the degree of use of a variety of clinical information resources in three clinical scenarios: an outpatient department, wards and emergency rooms, has been identified.

In accordance with the literature review and research aims, objectives and questions, the research design strategy has been developed to explore the information needs and seeking of doctors in Kuwait government hospitals, which is presented in the next chapter.

Chapter Four

Research Design Strategy

4.0 Introduction

In order to explore in detail the information needs and seeking of doctors in Kuwait government hospitals, it was important that an appropriate research design was in place. A combined technique of both qualitative and quantitative methods was employed to obtain a detailed understanding of the phenomena under investigation. This chapter is organised into four main sections. The first section discusses the preliminary steps followed to decide the appropriate research approach and data collection techniques. The second section explains the range of data gathering techniques used in the research and the sampling method for each data gathering stage is described. The third section explains the data analysis methods used.

4.1 Preliminary steps for selecting the research design strategy

In designing research, there are some preliminary steps which can help the researcher to consider the strategy of inquiry that will be used and to identify specific methods in his/her research. The steps involve reviewing the research questions, aims, and objectives and reviewing the methods used in previous research into doctors' information needs and information seeking. Also, assessing the research philosophy or paradigms can help in deciding the appropriate research design strategy. All these steps are explained in more detail in the next sections.

4.1.1 Step one: research questions, aims and objectives

Reviewing the research questions, aims and objectives set out in chapter one helped in deciding the appropriate research methodology and techniques. Silverman (2005 p.112) points out "there are no right or wrong methods. There are only methods that are appropriate to your research topics and the model with which you are working". Going over the research questions, aims and objectives, suggested that this study is exploratory in nature. Reaves (1992, p.9) described exploratory research as investigating "phenomena or situations that are not familiar". Exploratory research is ideal in a situation when the researcher sets out the question for investigation and there is insufficient information to provide an idea of the sorts of answer that might be found. Newman (2005, p.33) has a similar view and pointed out that the primary purpose of exploratory research is to examine a little-understood issue or phenomenon to develop preliminary ideas and move toward refined research questions by focusing on the 'What' question. Also, Silverman (2005) added another aspect of the exploratory method study, that it is a useful method of examining a new environment or breaking new ground when

the subject has not been covered by other researchers. Thus, since little is known about the information needs and information seeking of doctors in general government hospitals at Kuwait, exploratory research seems to be called for in order to answer the research questions. In this study some questions were set out to ask "what" for exploring issues surrounding the information needs and seeking of doctors in KGH. Bless and Higson-Smith (1995) stated that exploratory research aims to gain insights into a situation, phenomenon and person or community. This study is directed toward describing what happens in the situation of the current information provision in KGH. It will investigate doctors' information needs and information-seeking behaviour to help in developing a successful information system for KGH.

Reaves (1992) describes some difficulties encountered by the exploratory research method. The first difficulty refers to the sort of information produced by the exploratory research. Exploratory research provides rich, complex and non-specific information. Thus, the researcher must approach the exploratory research with an open-mind and free of any expectation of what will be found. Also, most researchers carrying out exploratory research are less satisfied that their project is truly finished since exploratory research provides new ideas, surprises and raises more new questions than answers. Thus, this research project aims to continue to answer some of these new questions which will hopefully be addressed by the researcher or other researchers interested in the information seeking behaviour research subject area. Another difficulty faced by researchers in exploratory research, is the difficulty in controlling their subject matter. They should observe things in their natural state and should be aware of the danger that their observation, though accurate, might be misleading. This research was designed to take into account the exploratory purpose. An interesting research question was developed concerning the exploration of the information needs and seeking of doctors in

Kuwait Government hospitals (KGH). Thus exploratory research is an appropriate approach to undertake.

4.1.2 Step two: examples of methods used in previous studies

The literature review in the previous chapter showed some examples of methodologies that have been used in studies of information needs, use and seeking by doctors working in primary healthcare and hospitals. Table 4.1 (see pp.124) gives a summary of these previous studies. It describes the name of the study and the year, the type of research approach, the type of data-collection techniques used, the type of samples and the countries where the studies were conducted. The literature review showed that several research approaches and methods of data collection had been adopted by different researchers. Survey research was a common approach in many studies. (Bowden, Kromer, and Rajia 1994, Nylenna and Aasland 2000, Wilson, Glanville and Watt 2003, Ocheibi and Buba 2003, and Rajan *et al.* 2008). The most common instruments of data gathering used in those studies were questionnaires distributed using different methods (mail, fax and electronic). Bennett *et al.* (2006) supported the survey approach because it allows access to a large sample of doctors. Wilcox *et al.* (2001) encouraged the distribution of questionnaires by fax. They found that fax surveying was effective in eliciting survey responses, particularly from the community of doctors.

Table 4.1: Previous studies in information needs and seeking behaviours

Name of Study	Research Approach	Research methods	Type of Participants	Country
Bowden, Kromer, and Rajia (1994)	Survey	Questionnaires (mail)	Doctors (all doctors are working in five Texas Counties)	Texas Counties, USA
Nylenna and Aasland (2000)	Survey	Questionnaires (mail)	Doctors (primary & hospital)	Norway
McKnight et al. (2002)	Triangulation qualitative methodology	Semi-structured survey (web page, email and paper) & focus groups	Inpatient doctors and nurses in Presbyterian hospital campus of the New York Presbyterian hospital	New York, USA
Wilson, Glanville and Watt (2003)	Survey	Postal Questionnaire & semi-structured interviews	Primary Care Trust staff (managers, nurses and doctors) in the Northern and Yorkshire region	UK
Ramos, Linscheid &Schafer (2003)	Triangulation	Direct observation & self-report	Residency doctors associated with University of California San Francisco-Fresno)	California, San Francisco, USA
Ocheibi & Buba (2003)	Survey	Self- administered mailed questionnaire	Doctors (University of Maiduguri Teaching Hospital, government hospitals and private hospitals/clinics)	Maiduguri, Nigeria
Bryant (2004)	Case Study, Quantitative and Qualitative (triangulation)	Documentary analysis, interviews and group discussion	Family doctors	UK
Cheng (2004)	Triangulation	Mailed questionnaires, interviews & randomized controlled study	Hospital clinicians	China
Bigdeli (2004)	Not stated	Paper questionnaires	Specialists, residents & interns at the hospital of Ahvaz University of Medical Sciences	Iran
Lappa (2005)	Pilot Study	Questionnaires Interviews	Clinicians (doctors & nurses) & Medical Librarians in Emergency Care in Greek hospitals	Greece
Boissin and Docsi (2005)	Qualitative	Interviews	General Practitioners	France
Tan et al. (2006)	Qualitative	Interviews	Cancer clinicians in New South Wales public hospitals	Australia
Bennett et al. (2006)	Survey	Questionnaires (Fax)	Doctors (primary & hospital)	USA
Rajan et al. (2008)	Survey	Paper questionnaires	Clinicians (GP, Surgeons, other specialties & dentists) in a Semi Urban Town in Southern India	India

On the other hand, some studies encouraged the use of a qualitative approach by using data gathering instruments such as interviews. For example, Boissin and Docsi (2005) used the qualitative approach using interviews to investigate the information seeking behaviour and use of the Internet by the general practitioners in France. They pointed out that interviews were better than a questionnaire in providing an in-depth understanding of how GPs used the Internet.

Other studies encouraged the use of the case study approach. Bryant (2004) believes that the case study approach is a powerful method which provides an in-depth view. Also, the focus group was another method utilized in research into the information-seeking of doctors (Mullaly-Quijas, Ward and Woefl 1994, Bryant 2004). It is a qualitative technique useful for gathering opinions and perspectives of particular groups of participants in a given setting at a particular time (Case 2007). Moreover, a combination of different methods was another approach used by researchers in the particular area. Smith (1996) indicated that combined methodologies of interviews to supplement structured questionnaires seemed to have produced a more in-depth understanding of doctors' information needs and were the preferred method to date. Cheng (2004) also supported the use of a triangulation research strategy and pointed out that this strategy presents different, complementary, views of the information-seeking behaviour of clinicians who are working in hospitals.

The above discussion provides an idea of the types of research approach and data-collection techniques that have been used in the previous studies of the information needs and seeking of doctors. It was clear that there was no single specific research approach being used. Studies were conducted in different context approaches. Methods

were probably developed according to the sort of research questions as suggested by Gorman and Clayton (2005).

4.1.3 Step three: philosophy of the research

This step involves assessing philosophical assumptions, epistemologies, and ontologies (Crotty 1998) or paradigms (Lincoln and Guba 2000) or knowledge claims (Creswell 2003) or broadly-considered research methodologies (Newman 2005). Generally, philosophy is defined as "constructing the whole of human knowledge into logically connected systems" (Hughes 1980, p.14). Trochim (2000) explained the difference between epistemology and ontology. The term epistemology originates from the Greek word '*episteme*' which means 'the knowledge'. Epistemology is the philosophy of knowledge. It is associated with ontology and methodology. Ontology includes the philosophy of reality while epistemology focuses on how we come to know that reality. However, the methodology identifies the particular practices used to achieve that knowledge (Krauss 2005). On the other hand, LeCompte and Schensul (1999, p.41) used the term 'paradigm' and defined this as a "paradigm constitutes a way of looking at the world; interpreting what is seen; and deciding which of the things seen by researchers are real, valid, and important to document". Creswell (2003, p.6) defined a knowledge claim assumption as follows "the researchers start a project with certain assumptions about how they will learn and what they will learn during their inquiry".

It is important to be aware of philosophical assumptions for several reasons. Guba and Lincoln (1998) emphasised the importance of paradigm issues. They point out that it is difficult for any investigator to undertake an inquiry or investigation without being clear

about the paradigm to be used. Easterby-Smith *et al.* (1997) show three ways in which the philosophy helps in identifying a particular research methodology:

- It assists the researcher to identify the type of research methods to be used in a study. These include the type of evidence to be gathered and its origin, the way in which such evidence is interpreted and how it helps to answer the research questions.

- Understanding the research philosophy will help the researcher to evaluate different methodologies and methods. The researcher can identify the limitations for each particular approach at an early stage. This will help to avoid inappropriate use and unnecessary work.

- It may help the researcher to be creative and innovative by selecting or adapting methods outside his or her previous experience.

The philosophies of research are discussed by different schools of thought in different ways. The literature discusses four major schools of thought about knowledge claims (Hughes 1980, Tashakkori and Teddlie 1998, Creswell 2003 and Pickard 2007): positivism, postpositivism, constructivism, and pragmatism. Each school has distinctive elements.

The first positivist school or positivism dates back to the 19th century French philosopher August Comte and the 17th century British empiricist philosopher John Locke (Tashakkori and Teddlie 1998). This school believes that there is a single reality. The relationship between the knower and known are dualist or independent. Thus, the researcher acts as an observer and reports on the reality that is discovered through this observation. In addition, learning is transferring what exists in reality to what is known

by the learner. This school also applies deductive logic. There is concern in arguing from the general to the particular (Tashakkori and Teddlie 1998). The strategy of inquiry associated with this school is the quantitative approach (Pickard 2007).

The second postpositivist school or postpositivism refers to scientific knowledge. It evolved in the 19th century as a reaction to positivism (Pickard 2007). The major differences distinguishing postpositivism from positivism are that the knower and the known cannot be divorced, and the absence of a shared, single reality (Pickard 2007, p.7). Therefore, postpositivism reflects "a deterministic philosophy" which investigates the relationship of causes and effects or outcomes. This is also "reductionist" because it focuses on dividing the idea into small, separate, sets of testable ideas (e.g. variables that form hypotheses and research questions). The knowledge that builds from a postpositivist approach is based on empirical observation and measurement of the objective reality of the "real world". Therefore, the principal features for the postpositivist approach are developing numeric measures of observations and studying the behaviour of individuals (Creswell 2003). Finally, it involves theory verification, which means that the researcher starts his/her study with a theory. Then he/she gathers data that either supports or rejects the theory. The researcher should then make the necessary revision before implementing the additional new tests. The strategy of inquiry associated with this school is the quantitative approach (e.g. true experiments and quasi-experiments) (Creswell 2003).

The constructive assumptions or social constructivism (i.e. interpretivism or naturalism) is the third major school (Tashakkori and Teddlie 1998 and Creswell 2003). It is based on the belief that individuals seek understanding of the world in which they live and work. Individuals develop varied subjective meanings of their experiences, which focus

on certain objects or things, which direct the researcher to look for a complexity of views rather than narrowing meanings into a few categories or ideas. Therefore, the purpose of research relies as much as possible on the views of the participants of the situation being studied. This encourages the asking of broad and general questions so that the participants can build the meaning of a situation, a meaning typically forged in discussions or interactions with other persons. The more open-ended the questioning, the better, since the researcher can then listen carefully to what people say or do in their real-life settings. Often these subjective meanings are negotiated socially and historically. The researcher understands that their own background forms their interpretation, and they "position themselves" in the research to identify how their interpretation flows from their own personal, cultural and historical experiences. The researcher's aim is to interpret the meanings others have about the world in order to generate a theory, rather than starting with a theory, as in postpositivism. Thus, the knowledge is constructed, not transmitted. It reflects inductive logic in which the argument moves from the particular to the general (i.e. grounded theory) (Tashakkori and Teddlie 1998). This philosophical assumption is associated with a qualitative approach in which interviews and observation are the most appropriate data collection methods (Creswell 2003, p.8).

The fourth philosophical school is pragmatism. Its roots lie with some American scholars, particularly C.S. Peirce, William James, and John Dewey (Tashakkori and Teddlie 1998). Bryant and Charmaz (2008, p.609) stated that pragmatism is an "American philosophical tradition that views reality as characterised by indeterminacy and fluidity, and as open to multiple interpretations". Creswell (2003) mentioned that the pragmatist school of science is positioned within a value framework that questions how

we know something. Pragmatism is considered as the foundation of the mixed-method approach (Patton 1990, Tashakkori and Teddlie 1998, Creswell 2003).

Given the research questions, aims and objectives as outlined in chapter one, it seems that pragmatism is the appropriate school for this research. This is according to the following parameters identified for this paradigm. The distinguishing features of this school are, firstly, "consequences of actions". The knowledge claims from most different forms of pragmatism arise out of actions, situations, and consequences. In contrast, the knowledge claims in postpositivism arise from antecedent conditions (Creswell 2003, p.11). This research is exploratory; seeking needs, views and opinions from a known population: 'doctors'. The study will investigate the information needs and seeking of doctors in different clinical situations. Secondly, pragmatism is problem-oriented. In this position there is a greater concern for the problems or research questions than for the methods, which enables researchers to use all approaches to understand them (Rossman and Wilson 1985 and Tashakkori and Teddlie 1998). Another feature is the pluralistic and real-world practice-oriented approach. Using pluralistic approaches tends to drive knowledge about the problem. In this position, individual researchers have a freedom to choose the methods, techniques and procedures of research that are suitable to meet their needs and purposes (Creswell 2003). Pragmatism supports the use of multiple methods such as using both qualitative and quantitative research methods in the same research and within multistage research programs (Tashakkori and Teddlie 1998). Thus, there is a great focus on the problem underlying the research and research questions than for the methods. Consequently, the researcher needs to seek different types of data (quantitative and qualitative). Thus, the data will be gathered by using different methods and instruments of data collection. Creswell (2003, p.12) stated that "pragmatists do not see the world as an absolute unity". Mixed-methods researchers look to many approaches

for collecting and analysing data rather than focusing on only one method (e.g. quantitative or qualitative). Brewer and Hunter (1989, p.74) stated that:

However, the pragmatism of employing multiple research methods to study the same general problem by posing different specific questions has some pragmatic implications for social theory. Rather than being wed to a particular theoretical style . . . and its most compatible method, one might instead combine methods that would encourage or even require integration of different theoretical perspectives to interpret the data".

Another point regarding pragmatism and mixed-methods pointed out by Tashakkori and Teddlie (1998) is that the making of decisions about the use of research methods, such as mixed-methods or qualitative or quantitative methods, depends on the research question as it is currently posed and the stage of the research cycle that is ongoing. Pragmatists agree that research always occurs in a context, such as social, historical, and political. Thus, the mixed-methods approach may involve a theoretical lens that has social justice and political aims built in. This research occurs in the context of studying information needs and information seeking behaviour of doctors in KGH. The researcher will investigate the problems from two contextual views: the information seeking behaviour view and the health informatics context. In addition, this assumption believes in a need to end the asking of questions about reality and the laws of nature (Creswell 2003). Tashakkori and Teddlie (1998) stated that pragmatism avoids using the concepts of metaphysics such as "truths" and "reality" that have caused endless discussion and debate.

Finally, pragmatism accepts that the researcher has a choice of inductive and deductive logic throughout the research process to answer the questions they need. As this research is exploratory in nature, the researcher will look at the problem moving from general observations to specifics to explore more details about the research problem. On the

other hand, the researcher will also then move from specifics to general observations, through highlighting interesting issues raised in the research findings and exploring them in more detail.

Pragmatism is ideal for mixed-method researchers. It encourages the use of multiple methods, different worldviews and different assumptions. In addition, it supports different types of data collection and analysis. All this will be suitable for this research position. So the research approach of this study uses a mixture of methods, which will be explained in more detail in the next section.

4.2 The research approach of the inquiry

Based on the above, the most appropriate research strategy design for this investigation involves a mixed-method approach. It can be defined as the "combining of different methods within the same study design" (Bloor 2006, p.116) and was first used in 1959, when Campbell and Fiske used multiple methods to study the validity of psychological traits (Creswell 2003).

This research deals with, and comes under the broad area of, user studies. Most researchers in user studies agree that either a qualitative or quantitative approach is appropriate, depending on the nature of the study. Reaves (1992, p.357) defined qualitative research as:

"A type of research that emphasizes the personal meaning of events to the people who experience them, typically using measurement on the nominal level if at all. Usually contrasted with quantitative research".

The major characteristic of qualitative research is that it emphasises words rather than numbers (Bryman 2008). A researcher using qualitative research methods is generally interested in categorical rather than numerical responses (Yin 2003). Thus, the researcher in this study needs to use methods of data collection that can represent the research problem with words. Qualitative research is used for exploratory studies leading into more structured or quantitative studies (Hakim 1997). In this study a qualitative approach has been used to understand doctors' perceptions and to explore their information needs in different scenarios and contexts. The researcher is concerned to understand individual perceptions of the world (Bell 2005). This approach also fits well with Hussey and Hussey's views (1997, p.20). They defined qualitative research as, "a subjective approach which includes examining and reflecting on perceptions in order to gain understanding of social and human activities".

In addition, the researcher wished to explore the information seeking of doctors, to investigate what (e.g. type information of resources are sought by doctors), where (e.g. outpatients, wards and emergency rooms), when (e.g. working hours and non-working hours), how (e.g. accessing Internet and communicating with colleagues) and why (e.g. continue education or clinical decision making) doctors seek information. All these factors would be best investigated using a qualitative approach since it offers richly descriptive reports of individuals' perceptions, attitudes, beliefs, views and feelings (Hakim (1997). Another aspect of qualitative research is that which involves an inductive approach placed on the generation of theory (Bryman 2008). Hakim (1997, p.28) said that "if surveys offer the bird's eye view, qualitative research offers the worm's eye view". The qualitative research approach provides a variety of technical and integrated information about attitudes and experiences in coherent and meaningful patterns and perspectives.

A wholly qualitative approach was considered. However, the breadth and large quantity of data that would be gained from the quantitative approach persuaded the researcher to also follow a broader strategy by using an additional quantitative approach. Quantitative research is defined by Reaves (1992, p.357) as:

> *"A type of research that emphasizes the numerical measurement of variables at the ordinal level or higher. Usually contrasted with qualitative research".*

According to Bryman (2008) the quantitative research approach contrasts with qualitative approach in that a quantitative strategy emphasises the collecting of words, actions and records at mathematically significant levels. Thus, by collecting and analysing numbers rather than words, it supports a deductive approach in which emphasis is placed on the testing of theories. In this research, the researcher needs to examine and compare different clinical scenarios (e.g. outpatient departments, wards and emergency rooms), different sources of information (print, electronic resources and interpersonal communication), different categories of participants (e.g. registrar, specialists and consultants doctors) and different locations (teaching hospitals and non-teaching hospitals). The quantitative approach will be ideal for all these associated factors. In quantitative research, researchers collect facts and examine the relationship between these facts, the researcher can also collect data from large samples and this will help to generate the result for the population (Bell 2005). All these data are described and expressed numerically.

The mixed-method approach was chosen for this study to combine the benefits of both the quantitative and qualitative approaches. Thus, mixed-method research is the third paradigm that helps researchers to link the break between quantitative and qualitative research (Onwuegbuzie and Leech 2005). Morse (2005, p.583) stated that mixed-method

research "consists of designs that are either primarily qualitative or quantitative and that incorporate strategies of other methods (either qualitative or quantitative) into the same research project". It was clear in the previous section that the research approach is primarily qualitative yet integrated with the quantitative approach.

There are several advantages to this approach. The major advantage of using the mixed-methods approach indicated by Teddlie and Tashakkori (2003, p.15) is that the quantitative approach is concerned with theory verification, however, the qualitative approach is more directed to theory generation (exploratory). Thus, combining the two approaches enables the researcher "to simultaneously answer confirmatory and exploratory questions, and therefore verify and generate theory in the same study". Greene, Kreider and Mayer (2005, p.275) mentioned that a mixed-method approach is able to provide different patterns of better understanding including: a) "Understanding more defensibly". Triangulating results provides strong and valid data and reduces known bias; b) "Understanding more comprehensively". It draws a complete and clear picture of the social world through seeking different perspectives and lenses; c) "Understanding more insightfully with new ideas, creative concepts and meanings". This happens when the results diverge and need reconciliation via further analysis and reframing; and d) "Understanding with greater value consciousness and with greater diversity values" through the integration of different types of methods which enhance different values.

In addition, the mixed-method approach will expand the breadth of the study. According to Gorman and Clayton (2005), when researchers adopt two or more methods, they will be able to address different aspects of the same research question, thereby extending the breadth of the study. Bloor (2006) mentioned that the purpose of such a combination

may be additive, with different methods addressing different sub-topics, or interactive, with the same sub-topic being approached from different angles. Also, the researcher is able to compensate for inherent weaknesses in each approach (Gorman and Clayton 2005). For example, by mixing data-collecting methods, particularly by using a quantitative method associated with a qualitative method, the researcher is able to draw on the unique strengths of each, thus providing both "macro- and micro-level perspectives in a single project" (Gorman and Clayton 2005, p.13). Another benefit of using this approach is that multiple methods are frequently used at different stages of the research process (Creswell 2003, Bloor 2006). Reams and Twale (2008) see mixed-methods research as having the following benefits: the y help to find out more and comprehensive information and perspectives, enhance the corroboration of the data, reduce the bias and provide a more accurate conclusion.

Although mixed-methods are a valuable approach, there are some uncertainties in making analytical sense of the data collected. Silverman (2005) points out that mapping one set of data upon another can be a complicated task depending on the analytical framework. In particular, if the research treats social reality as being constructed in different ways in different contexts, then it cannot appeal to a single phenomenon that all the data apparently represents. Tashakkori and Teddlie (2003) indicated some disadvantage of using the mixed-method approach, these are that it requires training in using both methods (qualitative and quantitative), has a high cost and requires researchers to work in multiple teams. O'Byrne (2007, p.1381) pointed out:

"Although mixed and multiple-method research designs are currently gaining momentum and popularity, it is essential that researchers undertake a critical analysis of the process of mixing "mainstream" research designs with newer methods before commencing".

There are several models for combining the qualitative and quantitative approaches, and no one right way. Thus, the researcher needs to consider how and why they are combined and set these against the circumstances, context and practical aspects of the research (Punch 2005). Creswell (2003) identified three strategies in mixed-method research, including:

- *Sequential procedures*: in this strategy the researcher seeks to elaborate the findings of one method with another. For example, the researcher may start with the qualitative method for exploratory purposes, following up with a quantitative method with a large sample so that the researcher can generalize results to a population. In addition, the researcher can reverse the procedure by starting with a quantitative method in which theory can be tested, then follow with qualitative methods to explore the findings in more detail.

- *Concurrent procedures*. In this design, the researchers will provide a comprehensive analysis of the research problem by bringing together quantitative and qualitative data. For example, the researcher collects both qualitative and quantitative data at the same time then integrates the information in the interpretation of the overall results.

- *Transformative procedures*. In this design, a theoretical lens will be used as an overarching perception within a design that has both quantitative and qualitative data. This lens suggests a framework for topics of interest, methods for collecting data, and the outcomes or changes anticipated by the study. "Within this lens could be a data collection method that involves a sequential or a concurrent approach" (Creswell 2003, p.16).

Some researchers call this design triangulation. Newman (2005, p.149) defined triangulation as the "idea that looking at something from multiple points of view improves accuracy". This research strategy helps to see the research problems from different views and perspectives to improve the accuracy of the outcome. Bloor (2006, p.170) defined it as the "systematic comparison of findings on the same research topic generated by different research methods. Such comparisons are often portrayed as a procedure of validation by replication, but the portrayal is misleading". There are four major types of triangulation:

- *Triangulation of measures*. In this type of research, several measures of the same phenomena are obtained. By measuring something in more than one way, researchers are more likely to see all aspects of it.

- *Triangulation of observers*. A variety of observers are employed, so a variety of data will be gathered which provides a more complete picture of the setting.

- *Triangulation of theory*. This happens when a researcher employs multiple theoretical perspectives in the planning stages of research, or when interpreting the data. For example "the researcher plans the study using the concepts and assumptions of both conflict theory and exchange theory or looks at the data coming from each theoretical perspective" (Newman 2005, p.150).

- *Triangulation of method*: This is defined as mixing qualitative and quantitative styles of research and data. Mixing the styles can occur in several ways. Sequentially, means first one and then the other. Another way is to use the two methods in parallel or both simultaneously (Newman 2005).

Thus, a sequentially designed, mixed-method approach is the methodology of this study, starting with a qualitative method using the focus group data-collection technique for exploratory purposes and following up with a quantitative method involving a semi-structured questionnaire to test some key findings from the focus groups and also other issues uncovered from a large sample and to generalize the results to a population. In addition, the researcher ended by using the qualitative method by using telephone interviews to provide more detailed findings and then draw a rich picture of the information provision in Kuwait Government hospitals. Figure 4.1 in the next page shows the flow diagram of the research design process.
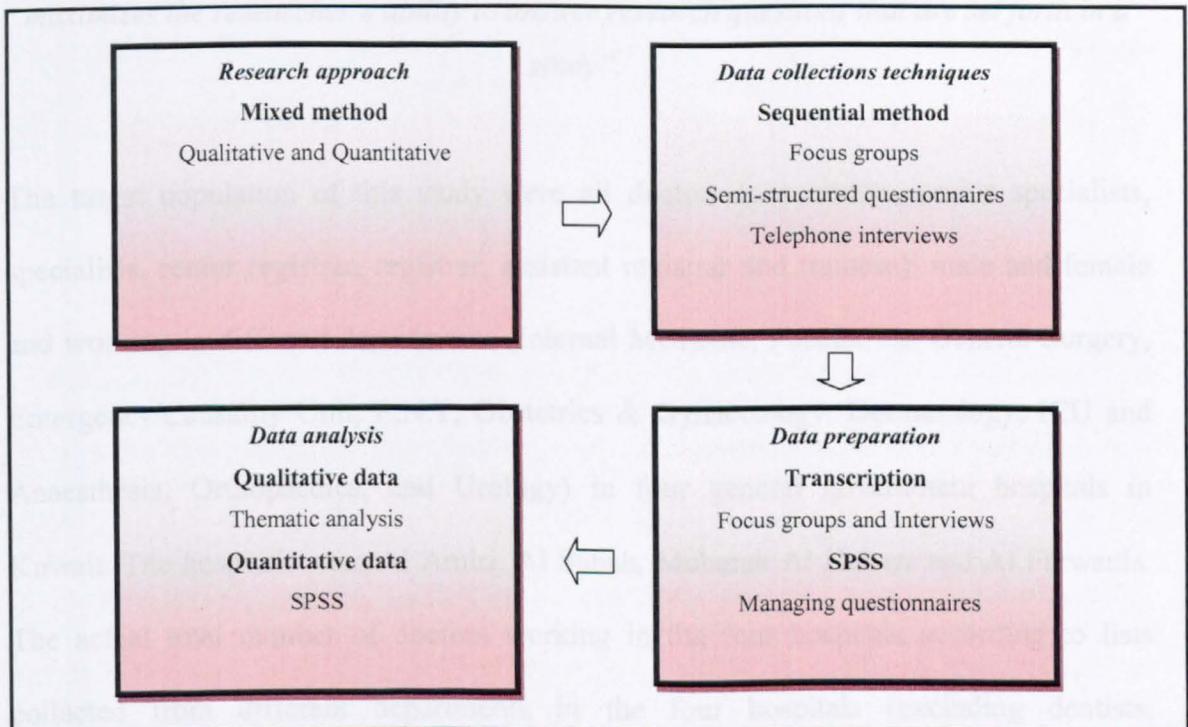
Figure 4.1: A diagram of the research process

Details of the data collection instruments and the selection of participants are explained in the next section.

4.3 Data collection and sampling

4.3.1 Population and Sampling

Population is the whole people or phenomena under study (Somekh and Lewin 2005) while sampling has been defined as "the selection of cases from wider populations" (Bloor 2006, p.152). Tashakkori and Teddlie (2003, p.715) provide a comprehensive definition of sampling as:

"Selecting units (e.g., events, people, groups, settings, artefacts) in a manner that maximizes the researcher's ability to answer research questions that are set forth in a study".

The target population of this study were all doctors (consultants, senior specialists, specialists, senior registrar, registrar, assistant registrar and trainees); male and female and working in different departments (Internal Medicine, Paediatrics, General Surgery, Emergency/Causality Unit, E.N.T, Obstetrics & Gynaecology, Dermatology, ICU and Anaesthesia, Orthopaedics, and Urology) in four general government hospitals in Kuwait. The hospitals were Al Amiri, Al Sabah, Mubarak Al Kabeer and Al Farwania. The actual total number of doctors working in the four hospitals according to lists collected from different departments in the four hospitals (excluding dentists, psychiatrists, medical students and departments that refused to participate in the study) was 988 (273 female and 715 male). However, 12 doctors were added to this total. The 12 doctors were a number of trainees from two departments in Mubarak Al Kabeer and Al Sabah hospitals, which had been unsure of the number of trainees in their staff list. Thus, the total population of this study is 1000 doctors.

4.3.1.1 The rationale behind the selected population

The population for this study is doctors. The researcher chose doctors rather than other healthcare providers such as nurses and allied health professions because clinical decision-making forms a larger part of doctors' work than with other health professionals. In addition, doctors make the initial diagnosis then, if any further procedures or investigations are required, they will refer the patient to other professionals. So doctors are in the front line facing patients. Also, the researcher chose a range of different job titles of doctors, such as consultants, senior specialists, specialists, senior registrar, registrar, assistant registrar and trainees. Medical students were excluded from the study because their purpose is to receive training and their information requirements will be different from those of the actual doctors in the hospitals.

In addition, the selected doctors work in a government hospital setting. The researcher chose the hospital setting rather than the primary care setting and also government not private for several reasons: firstly, there are few studies in the literature conducted to investigate the information needs and information-seeking of doctors in the hospital setting. Furthermore, in Kuwait, there have been no studies exploring the information needs and information-seeking of doctors working in Kuwait hospitals. The second reason is that the Healthcare Information System is still under development in the government hospitals and doctors are important end-users of the current system. So the study will add a benchmark to any suggestions for improving the system. Also, the number of doctors working in government hospitals is greater than the number of doctors working in private hospitals. This will help the researcher to extend the number

of responses to the study, which will help in improving the analysis and building a theory. Government hospitals handle the high-risk cases. It is therefore important to focus on this sector to improve the services to provide a high quality of care for the more difficult cases. The facilities and equipment in government hospitals are more developed than in the private sector. In addition, investigating information-seeking in the hospital setting is worthy of study because in this environment, which is enriched by several contextual factors, the researcher can investigate different clinical scenarios of doctors' information-seeking (outpatient departments, wards and emergency rooms).

The researcher selected four hospitals located in different counties in Kuwait. This will increase the diversity of participants and allow for the generalization of the findings. Another interesting context is the researcher's selection of both teaching-based hospitals and non-teaching hospitals to improve the quality and diversity of the data. Finally, the researcher chose general hospitals (secondary care) not specialist hospitals (tertiary care) because the general hospitals contain several specialities and the number of doctors is larger.

Finally, the researcher chose four general hospitals (Al Amiri, Al Farwania, Al Sabah and Mubarak Alkabeer) from a total of six general hospitals for several reasons. Firstly, Al Amiri hospital is a well-known government hospital in Kuwait and uses advanced technology. The Healthcare Information System was started early in this hospital. Most high-risk operations take place in Al Amiri and it has the highest proportion of Kuwaiti staff. Al Sabah hospital was the first hospital to be established in Kuwait. It is the biggest hospital and it has a large staff of doctors. The information services available, such as the Medical Records Department, are very old and simple. This hospital

provides many different specialisms of medical care. Mubarak hospital was chosen for two main reasons: it is a teaching-based hospital and it is attached to the Faculty of Medicine, which has the Health Sciences Centre library. Al Farwania hospital has similar characteristics to the other two hospitals which were not selected: Al Jahra and Al Adan. The three hospitals are located in the south and north of Kuwait, far away from the central hospitals. Most Bedouin people live there. From the three hospitals, the researcher selected only Al Farwania because it is the closest one to the other three selected hospitals (Al Amiri, Al Sabah and Mubarak). This would help the researcher save time and money travelling between one hospital and another. In addition, Al Farwania has some useful characteristics such as the Hospital Information System, its good number of staff and its provision of healthcare services to a large number of people in Kuwait.

4.3.1.2 Sampling method

It is obvious from section 4.2 that this research uses a mixture of two approaches: the qualitative and the quantitative. The mixed-methods research approach frequently requires a mixed-methods sampling procedure, so as to increase internal validity and generalisability (Kemper, Stringfield and Teddlie, 2003). This method, called multiple mixed sampling, is defined as a "sampling strategy in which probability and purposive sampling techniques are used at different levels of the study (e.g. students, class, school, district) (Kemper, Stringfield and Teddlie 2003, p.287).

Thus, sampling methods in the study have been chosen according to the natural strategy of both approaches (qualitative and quantitative). Generally, there are two major categories of sample: probability and non-probability (purposive). Probability sampling

is appropriate for the quantitative approach in order to improve the generalization of research findings. Tashakkori and Teddlie (2003, p.713) described the probability-sampling strategy as:

"Selecting a relatively large number of units from a population, or from specific subgroups (strata) of population, in a random manner where the probability of inclusion for every member of the population is determinable".

The commonly-used probability sampling methods are simple random sampling, stratified random sampling and cluster sampling (Tashakkori and Teddlie 2003 and Fink 2003).

On the other hand, qualitative research rarely utilizes probability samples and typically uses small samples. Non-probability or purposive sampling used for the qualitative research approach is defined as "selecting specific units (e.g. events, people, groups, settings, artefacts), or type of units, based on a specific purpose rather than randomly" (Tashakkori and Teddlie 2003, p.713). The most common sampling methods include: convenience sampling, snowball and quota sampling (Fink 2003). There is a danger that qualitative researchers might know a lot about the subjects of their research but not much about the wider population (Bloor 2006). Fink (2003, p.22-23) provided a table (see Table 4.2) that demonstrates a summary of the common probability and non-probability sampling methods by giving the description, benefits and issues of each method.

Table 4.2: Résumé of selected commonly used probability and non-probability sampling methods in Fink (2003, pp.22-23).

Description	Benefits	Issues
Probability Sampling *Simple random sampling* Every unit has an equal chance of selection.	Relatively simple to do.	Members of a subgroup of interest may not be included in appropriate proportions.
Stratified random sampling The study population is grouped according to meaningful characteristics or strata.	Can conduct analyses of subgroups (e.g. men and women, older and younger; East and West). Sampling variations are lower than that for random sampling; the sample is more likely to reflect the population.	Must calculate sample sizes for each sub group. Can be time-consuming and costly to implement if many subgroups are necessary.
Cluster/multistage Natural groups or clusters are sampled, with members of each selected group sub-sampled afterwards.	Convenient; uses existing units (e.g. schools, hospitals).	
Non-probability sampling *Convenience sampling* Use of a group of individuals or units that is readily available.	A practical method that relies on readily available units.	Because sampling is opportunistic and voluntary, participants may be unlike most of the constituents in the target population.
Quota sampling The population is divided into subgroups (e.g. men and women who are living alone, living with a partner or significant other, not living alone but not living with a partner, etc). A sample is selected based on the proportions or subgroups needed to represent the proportions in the population.	Practical if reliable data exist to describe proportions (e.g. percentage of men over a certain age living alone vs. those living with a partner).	Records must be up-to-date to get accurate proportions.

The sampling techniques for this study were selected according to the type of research method and the techniques that had been applied. In addition, time, cost and the researchers' situations were also factors affecting the choice of the appropriate sampling method. The details of each sampling strategy are explained in more detail in the discussion of each stage of the data collection in the next section.

4.3.2 Data collection techniques

4.3.2.1 Qualitative approach using focus groups

The first step in the qualitative data collection process involved using focus groups. The following steps were taken:

4.3.2.1.1 Rationale for using focus groups

The focus group is a research method that "collects data through group interaction based on a topic that is supplied by the researcher" (Morgan, 1997, p.2). Bloor (2006, p.88) defined a focus group as "a sequence of audio-recorded group discussions" held with differently collected groups of individuals and facilitated by a researcher, where the aim is to provide data on group beliefs and group norms in respect of a particular topic or set of issues. Usually, the number of participants in the group ranges from 6 to 12 (Gorman and Clayton 2005). In this method the researcher works as the mediator between the question and the group and also between the individual members of the group (Pickard 2007).

The researcher considered focus groups for several reasons. First of all, they can be applied at any point in the research design. For example, focus groups may be employed during an early stage of an investigation, which allows the researcher to explore a topic and provide him/her with guidelines for further investigation. Also, focus groups can be conducted after observations in order to look for explanations for behaviour. In addition, they can be used as the last stage of data collection in order to confirm tentative findings (Pickard 2007). In this research, the focus groups were used as the preliminary step for three main reasons. Firstly, they were used as a tool to help in developing questions and

key topic areas for the semi-structured questionnaire used in the second stage of the data collection process. Secondly, the focus groups were utilized to explore and expand on the topic of the research and provide more key information on issues, especially important as this research is an exploratory study. In addition, the focus group method provides rich and valuable data. Goulding (1997, p.337) described the nature of the data provided by focus groups as "high quality, interactive and much richer than that from formal group interviews". Another benefit of using this technique is allowing a variety of perceptions, feelings and attitudes from contributors across a range of issues to be explored. For example, the researcher is able to conduct in-depth discussions with a small group of participants who may be only a sub-set of the target population (Pickard 2007). Also, focus groups fitted with the length of the project. Green and Thorogood (2004, p.111) observe that "focus groups have the potential for producing considerable information in a fairly short space of time". Gorman and Clayton (2005) added also that one of the major advantages of focus groups is speed. Only one or two hours are usually required for the focus group session, although this depends on the number and complexity of the questions. So researchers can collect rich data in a reasonable time. Other advantages are also provided by Gorman and Clayton (2005, p.147):

- *Transparency.* The researcher can interact with the participants' contribution. This will give them confidence to feel relaxed and participate in the study.

- *Interaction.* This method encourages the participants to interact with each other and not just react to the facilitator. This will allow several types of attitudes and beliefs to emerge. For example, "a facilitator might ask one participant to comment on, or react to, the contribution of another".

- *Flexibility.* This method provides an opportunity for direct feedback and clarification of suggestions, with the possible assistance of other group members.

- *Open-endedness.* The facilitator provides the opportunity for the group to explore aspects and features of a topic unexpected by the researcher. This is particularly appropriate when the possible range of answers is not known in advance.

- *Ability to note non-verbal communication.* The focus group allows the researcher to focus not only on verbal communication but also on non-verbal communication such as gestures, facial expressions and other forms, which can indicate depth of meaning.

On the other hand, there are some problems associated with this method. One of these disadvantages is getting people together. It is sometimes difficult to collect participants together, particularly if they are from different professions. Some participants may be late whilst others may never attend (Gorman and Clayton 2005). In this research, there were three focus groups, which were held in three different hospitals. The moderator gathered participants working in the same hospital. Each focus group took place separately and had participants from the same hospital. The moderator arranged the meeting for the focus groups through cooperation with the heads of medical departments in the three hospitals. The moderator sent the agenda (a copy of the meeting agenda is attached in Appendix III) for the meeting and the time and venue one week before the appointment, so the participants had time to prepare for the meeting.

Another difficulty associated with focus groups is dominating personalities. A very real hazard in such a relatively unstructured process is the domination of a group by a few vocal members. The skills of the facilitator/researcher in drawing out other members of

the group are important in this regard (Gorman and Clayton 2005). For reasons outlined below, the moderator in this study attempted to avoid this problem by excluding heads of medical departments and units. "Wanting to be agreeable" is another potential weakness in the focus group method. People seem naturally to prefer to agree rather than disagree with their peers; again, sensitive facilitation can help minimize this (Gorman and Clayton 2005). The moderator in this study announced that she was interested in knowing a range of opinions from participants. This encouraged participants to express their own views even when they were not in agreement with other speakers. Finding a typical group is another problem. Sometimes the focus group may include participants from different backgrounds such as professionals and non-professionals, men and women, and so on. So the researcher may face difficulties in identifying and convening a typical group (Gorman and Clayton 2005). The participants of this study were doctors working only in hospitals but they had different characteristics (female and male, Kuwaiti and non Kuwaiti, different job titles) to expose the various interactions of views and perspectives. The strategy of selecting participants of focus groups is explained in more detail in the next section.

4.3.2.1.2 Recruitment of participants

Qualitative data was be derived from the focus groups. Non-probability or purposive sampling methods are recommended for qualitative research. There are different types of non-probability sampling strategies shown in the previous section, such as convenience sampling, snowball sampling and quota sampling (Fink 2003). In this research "recruitment via an intermediary" was the appropriate strategy for the recruitment of participants for the focus groups. Recruitment via an intermediary can occur in 'snowball' sampling, for instance, where an appropriate individual is chosen by the

researcher and then that individual is willing to recruit appropriate members from their team. Thus, this individual acts as a contact point. He/she can attend the focus groups or act as an intermediary who is associated with the group but who will not necessarily take part in the discussion (Bloor *et al.* 2001, p.31). The intermediaries of this research were the heads of departments in the three hospitals. The Director of each hospital sent a circular to each head of department asking for participants. Each head of department then sent circulars to their staff to encourage them to volunteer for the research study.

This strategy of snowballing has some advantages as well as disadvantages. The obvious advantage is reduction of recruitment effort for the researcher. That is, the researcher will communicate with one main member rather than four or more. This will help in reducing researcher effort, but increase the reliance on good, thorough, research on the part of the intermediary. Thus, the research guidelines should be adhered to by the intermediary (Bloor *et al.* 2001). The researcher in this study ensured that each participant received adequate information about the study and consented to participate. The researcher gave clear guidelines to their intermediary, including the required number of participants to recruit, their characteristics, the purpose of this study, the time and the meeting place. Another advantage is that this is an appropriate method when the researcher has difficulty developing a sampling frame for the population (Bryman 2004). For instance, the researcher in this study found it difficult to get lists of potential participants. Some departments refused to give them while others had incomplete lists.

One of the disadvantages in recruiting via a leader is some sense of obligation on the behalf of the participants, possibly resulting in unenthusiastic and uncommunicative responses to the study (Bloor *et al.* 2001). The researcher avoided this problem by ensuring that the intermediary sent invitation letters to all staff inviting them to

participate as a volunteer. Other problems of using snowball sampling are sampling potential bias and inability to generalize, because it is unlikely that the sample will be representative of the population (Bryman 2004).

4.3.2.1.3 Focus group participants

As stated in the previous section, the population of the study is selected doctors working in four general government hospitals in Kuwait: Al Sabah hospital, Mubarak hospital, Al Amiri hospital and Al Farwania hospital. However, only three hospitals were chosen for the focus groups: Mubarak, Al Sabah and Al Farwania. The reasons for not involving Al Amiri hospital at this stage of data collection were: firstly, time constraints. The researcher had a limited time for collecting data. The focus groups were chosen from the departments which were more cooperative and responded quickly. The researcher contacted several heads of departments in the four study hospitals and selected the groups according to the time limitations. Secondly, the focus group method was chosen in this research as the preliminary stage, thus the main purpose was to explore some of the key points and aspects of the research topic and to assist in developing the questionnaire for the next stage of the data collection. Three focus groups were considered reasonable to achieve this purpose. Finally, the three focus groups consisted of individuals with different characteristics such as male, female, Kuwaiti, non-Kuwaiti, different job titles and ages, so covering the full range of possible respondents. The three departments participating in the focus groups were, the Surgical department in Al Farwania hospital, the Internal Medicine department in Al Sabah hospital and the Paediatrics department in Mubarak hospital. The details of participants' demographic data are explained in chapter five of the focus group findings.

4.3.2.1.4 Design of the focus group discussions

The focus group discussions were designed to explore more about the research problem and assist in developing the questionnaire, which was the second stage of the data collection method. Initially, the focus group discussions were open and general, starting by discussing the different situations where doctors meet patients and looking for preferable situations for clinical decision-making. Multiple probes and prompt questions were used to encourage the discussion and to explore more issues. The researcher developed a focus group discussion guide (See Appendix IV) to help in running the focus group session effectively. Each focus group session consisted of three main parts: introduction, topic and conclusion. However, the probes and prompts were different in each group session, depending on participant responses.

4.3.2.1.5 Pre-test focus group discussion guide

The focus group discussion guide was validated by the researchers' supervisors and another academic in the Department of Information Science in Loughborough University who had expertise in conducting focus groups. In addition, the researcher pre-tested the method by piloting it in Al-Amiri hospital; three members attended the pilot meeting, two Kuwaiti females and one non-Kuwaiti male. The three participants had different job titles, one female was a consultant in the Internal Medicine department, the other female was a registrar in the Surgical department and the male participant was a registrar in the Internal Medicine department. The participants were selected by the 'recruitment via intermediary' approach. The result of the pilot study provided the researcher with many important points to be considered in planning the focus group discussion, including the following:

- All participants were unfamiliar with the focus group method. They thought that this method was similar to group interviews rather than a discussion group. The researcher decided to explain the aim of the method in the introduction of each focus group meeting.

- There were three main discussion topics in the meeting, including;

  - Tell me about situations where you see your patients in the hospital.
  - Tell me about the preferable places for communicating with patients.
  - Could you talk about the important things you need to know when you see your patients?

The third topic was cancelled because the second topic stimulated the participants to talk and all probes and prompt questions were driven from this topic.

- Most of the focus group discussion was dominated by the consultant. The consultant showed some experience, making the other participants listen to her opinions more than argue and discuss. The researcher decided to exclude any heads of department and consultants from the focus group meetings to avoid this problem.

- The participants were familiar with some terminology in the research such as 'information', 'seeking', 'use', 'gather', 'library', 'resources', 'Internet', 'journals', 'criteria', 'clinical decision', 'MEDLINE', and 'clinical area'. However some terminology was avoided such as 'sources', 'situations', 'databases', and 'e.journals'.

- The researcher faced difficulty in collecting participants from different departments in one meeting. Thus, it was decided that each member of each

focus group meeting would be from the same department. This also helped to improve the homogeneity of the group.

- The researcher used two types of tape recorder: digital and analogue. The researcher found the digital more appropriate for recording the meeting. The voices of participants were clear and also the digital tape's recording time was longest.

4.3.2.1.6 Conducting the focus groups

Focus group sessions were conducted in October 2007 over a period of three days. The agenda for the time, venue and purpose of the meeting was sent to participants three days prior to the meeting. The use of a tape recorder was indicated in the agenda. The number of participants in each group was 4 or 5. Each focus group session took approximately one hour and ten minutes to complete. Audiotaping was pre-tested to determine any recording problems before the focus group session started. Groups were conducted by a moderator and an assistant. The researcher, acting as the moderator, directed the discussion and took minimal notes. The assistant, who works as a Clinical Instructor in the Faculty of Allied Health in Kuwait University, took comprehensive notes, operated the digital tape recorder and handled environmental conditions. The moderator and the assistant moderator received training in discussion techniques, such as non-verbal communication, written communication and listening. Meeting rooms in each hospital were booked by the intermediaries. Refreshments were provided. The following ethical considerations, related to the researcher-respondent relationship, were considered:

- Right to privacy: the researcher will respect the participant's privacy when entering their personal sphere and when asking questions (Sarantakos 1993).

- Proper identification: the researcher will identify themselves to the participants and will avoid giving false impressions of themselves or the aim of the study (Sarantakos 1993).

- The right of anonymity and confidentiality: Anonymity is "subjects remaining nameless" (Gorman and Clayton 2005, p.44). Data collected by the researcher will be anonymous, that is, not related to names or other forms of identification. Additionally, confidentiality refers to the "concealment of individual identity" (Gorman and Clayton 2005, p.44). Information offered by the participants will be used only by the researcher, and only for the purpose of the study. Also the participants were made aware that their information would be shown to the researcher's supervisors.

- Research participants should understand how far they will be afforded anonymity and confidentiality and should be able to reject the use of data-gathering devices such as tape recorders and video cameras (British Sociological Association 2004, p.5).

- Free and informed consent: respondents will participate in the research freely and will not be pressured or deceived in any way. The ASA Code of Ethics explains informed consent as:

"It is a basic ethical tenet of scientific research on human populations. Sociologies do not involve a human being as a subject in research without the informed consent of the subject or the subject's legally authorized representative, except as otherwise specified in this code" (American Sociological Association, 1999, p.12).

Another clarification of the content of informed consent provided by the British Sociological Association (BSA) is that the responsibility is on the sociologist to explain in appropriate detail, and in terms meaningful to participants, what the research is about, who is undertaking and financing it, why it is being undertaken and how it is to be disseminated and used (British Sociological Association 2004). In addition, the participants in the research should be made aware of their right to refuse participation whenever and for whatever reason they wish. In this research, the researcher provided informed consent forms for each participant of the three groups. (A copy of informed consent form is attached in Appendix V). The form was designed according to the Standing Committee for the Coordination of Health and Medical Research in the Kuwait Ministry of Health. The group discussion was conducted in English, since all members were able to speak English. The focus group session consisted of the following steps (Krueger 1998):

- Introduction. The session started with a brief introduction. The moderator and assistant moderator introduced themselves to the group of participants. Then, the moderator provided brief information about their profession and the purpose of this research. She also identified the method and procedures of focus groups. The moderator emphasised that she was not there to give opinions or share information. The moderator would listen to participants' perceptions because their opinions are what matter.

- Ice-breaker technique. Introductory ice-breakers were used to introduce participants to each other. Then, each participant was given a profile form to fill in with their demographic data. Also, informed consent forms were provided so

participants were assured of anonymity and confidentiality. In addition, each participant was assigned an identification number.

- Discussion of the topic. The focus group format employed open discussion with a number of follow-up probes and 'prompt' questions. The main topics focused around the following themes:

    ◀ Information needs of doctors.
    ◀ Information seeking of doctors.
    ◀ Obstacles in obtaining information.
    ◀ Improving information provision in Kuwait.

The session concluded by discussing any other issues relating to the information resources that participants would like to add. To show appreciation, the moderator and assistant thanked the participants for their opinions and perceptions. Also refreshments were provided before, during and after the sessions.

4.3.2.2 Quantitative approach using a questionnaire

The second stage of data gathering process was a semi-structured paper questionnaire to collect the quantitative data. The data collection at this stage is explained in more detail in the next section.

4.3.2.2.1 Rationale for using a questionnaire

The questionnaire was the second instrument for data collection used in this study. Questionnaires are the most popular method of data collection, particularly for studies

concerning human subjects (Pickard 2007). Bryman (2004, p.542) defined a questionnaire as "a collection of questions administered to respondents". Frazer and Lawley (2000, p.4) provided a similar definition. They said a questionnaire is "a formalized set of questions used to obtain information from respondents". Different types of data can be collected from a questionnaire of which Neuman (2005) mentioned two: factual information, which does not require much in the way of judgment or personal attitudes on the part of respondents (e.g. age, gender, marital status, number of children), and opinions, attitudes, views, beliefs and preferences, which do require some interpretation.

A questionnaire was the preferred strategy to achieve the following advantages: firstly, adopting a survey approach would enable the researcher to validate the factors that emerged from the focus groups, in order to reach accurate conclusions (Kimchi, Polivka and Stevenson 1991). Secondly, the researcher can gather data from a larger sample and more geographically dispersed community than would be possible using any other technique (Gillham 2000). Thirdly, a major feature of a survey is that information is obtained from a sample of subjects who are selected from a study population and then, on the basis of this information, the whole study population can be described. Other advantages include the potential to offer greater anonymity and that respondents are free to answer in their own time. Also, there is a lack of interviewer bias (Gillham 2000) and a reduced risk of the researcher's appearance influencing responses. Finally, it provides suggestive data to help in testing a hypothesis (Gillham 2000).

Some disadvantages of this method are the low response rate, self-selecting bias, complex questions leading to confusion, the lack of opportunity to clarify issues and the fact that levels of truthfulness cannot be measured, only assumed (Kumar 1999). In addition, Gillham (2000) outlined other disadvantages of using questionnaires. The

researcher may encounter the problem that the question has been misunderstood. Also, the respondent may have a poor level of literacy. People like to talk more than they write. While a number of research studies have been done in Kuwaiti hospitals in which researchers used questionnaires as a method of collecting data, many studies showed a low response rate (Al-Hajerri 2005). The reason for this is probably related to cultural issues and motivating respondents. These cultural issues are related to a widespread popular belief that such studies are not important for identifying problems: generally, people believe that questionnaires are a waste of time and few people are strongly motivated by questionnaires unless they can see them as having personal relevance (Gillham 2000). In order to overcome some of the disadvantages associated with questionnaires, and the issues related to the low response rate, the researcher took the following action:

- A covering letter explained the reasons for the research and identified the importance of this study for identifying the benefits of both satisfying the information needs of doctors and improving the information services of Kuwait government hospitals.

- Also, the covering letter stressed the confidentiality of the information obtained, and that the names and phone numbers of the doctors who would like to be interviewed would be treated in a confidential manner.

- Most of the questionnaires were handed to the doctors by the researcher in face-to-face meetings and in group meetings. Also, some questionnaires were posted by the head of departments' secretaries. The researcher made sure that participants completed the questionnaires in her presence (face-to-face). In addition, during the process of distributing the questionnaires, the researcher was

available for two to three days in each selected setting, before moving to another location.

- The researcher provided her telephone number in the covering letter of the questionnaire so participants could seek an explanation of any points that needed substantiation or clarification.

- A follow-up phone call was made to all head of departments' offices to make sure that the process of distributing questionnaires was going smoothly.

- Clear instructions and an attractive layout for the questionnaire were developed. For example, bold, italic and upper-case text formats were used for instruction statements to make them more clear and attractive.

- Informed consent was provided with the questionnaires, so respondents would participate in the research freely and would not be pressured or feel deceived in any way.

- The whole population was included to improve the response rate.

4.3.2.2.2 Types of questionnaires

The literature defined several types of questionnaire (Frazer and Lawley 2000, Czaja and Blair 2005 and Pickard 2007). These were categorized either by the format of the questionnaire or by the method of distribution. The researcher identified three main types of questionnaire:

- Electronic questionnaires. This covers both online questionnaires and questionnaires contained within an email message. It does not cover questionnaires produced using a word-processing package and then sent to

participants as an email attachment because this is still regarded as a paper-based questionnaire using a different mechanism for distribution. Electronic questionnaires have some disadvantages. One major drawback is limiting the sample population; online questionnaires usually allow an individual to submit multiple responses and it is particularly difficult to restrict submission from individuals outside the designated sample. Another problem is the technology itself; different browsers mean that it can be difficult to be totally sure of how the questionnaire will appear to everyone who opens it. A major consideration is the nature of the sample population. It is very easy to make assumptions about the sample's levels of access to the Internet as well as their skills in using online facilities (Frazer and Lawley 2000 and Pickard 2007).

- Telephone questionnaires. A questionnaire can be also administered by telephone interview. Telephone questionnaires are intermediate in cost between paper-based and personally-administered questionnaires. The researcher is able to control the order of questions and to establish a rapport with respondents and thus convince them to complete the interview and to believe in the authenticity and relevance of the research. Telephone interviews do have limitations. The inability to use visual aids, such as pictures, product samples and lists of response alternatives for questions with many answer categories are drawbacks. The respondents often do not trust telephone interviews and telephone survey questions should be short and simple (Frazer and Lawley 2000 and Czaja and Blair 2005).

- Paper-based questionnaires. This is the most common form. Researchers can distribute them in different ways, such as by post, handing them to individuals at events or leaving them in an obvious position where participants are encouraged

to complete and return them to the distribution point. Postal questionnaires are expensive because they require the researcher to enclose a stamped addressed envelope for the return of each questionnaire. Also the researcher will be relying heavily on the willingness of respondents to complete and return the questionnaire. A researcher-administered questionnaire is another approach for distributing a paper-based questionnaire. This type generally creates the highest response rate of any questionnaire, because the researcher approaches the subject and completes the questionnaire by asking the questions and filling in the document according to the information provided by the subject. In addition, distributing paper questionnaires to a group when they are gathered together in a particular location is usually the most successful approach (Frazer and Lawley 2000 and Pickard 2007).

The paper-based questionnaire form was used in this research. It was distributed to the participants in two ways. The first way was to post the questionnaires to doctors via the secretaries of each head of department in the selected hospitals. The second way was to distribute the questionnaires by the researcher in a face-to-face meeting and to groups of doctors when they were in morning meetings and weekly seminars. Upon completion, the participants were asked to put their questionnaires in drop boxes placed at different places in the hospital such as departmental secretaries' offices, doctors' offices and ward desks.

4.3.2.2.3 Questionnaire design

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

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

The information needed for the questionnaire was derived from the research questions, aims and objectives. Also, it built on what was learnt from the literature review and the focus groups. The population and sample frame were considered in this step. Four general government hospitals were selected from six general hospitals: Al Amiri, Al Farwania, Al Sabah and Mubarak Al Kabeer. The rationale behind choosing the target population was indicated in section 4.3.1.1. The whole population of the medical doctors in the four hospitals was selected as the sample set. This was for two main reasons: first of all, the researcher found it difficult to collect lists of doctors who were working in the four hospitals. In addition, doctors are very busy people and the researcher faced difficulty in collecting a good number of participants for the first stage of the data collection (focus groups). Thus, the researcher decided to distribute the questionnaire to all of doctors in the four hospitals to encourage a sizeable response. Thus, the total size of the population in this study was 1000 doctors.

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

Once the researcher has decided what information is required, the next step is that of choosing an appropriate type of questionnaire (mail, personally administered, telephone or Internet) (Frazer and Lawley 2000). The paper-based questionnaire of this study was self-administered by the respondents, so the researcher was careful to provide clear instructions and simple questions. Also, the researcher made sure that all questions in the questionnaire were related to the research questions, aims and objectives. Also any repeated questions were avoided.

Step three: prepare the draft questionnaire.

This step has four elements. Firstly, question contents. The question content was determined by the information needs in step one (Frazer and Lawley 2000). Each section in the questionnaire was developed by referring to various resources such as the research aims and objectives, researchers' knowledge and experience, focus group findings and literature from previous studies that had adopted a questionnaire approach. Table 4.3 in the next page shows each section of the questionnaire and the resources that helped establish each section.

The second element in this step is establishing the question wording. The choice of wording is critical in questionnaire design. The researcher made sure that each question in the questionnaire was linked to the study purpose and excluded any unfamiliar terms and concepts. The third element is the response format. The main concern for the selection of the response format is the data analysis method, which may identify a particular type of measurement e.g. nominal, ordinal, interval or ratio (Frazer and Lawley 2000).

Table 4.3: The questionnaire sections and referral resources

Sections of Questionnaire	References
Section A: Demographic data. QA1-QA9.	• Research aims and objectives. • Focus groups findings. • Researcher knowledge and experience. • The annual book of Manpower Statistics for the Year 2005 in the MOH (Manpower Statistics 2005). • Literature (Tan *et al.* 2006).
Section B: Information needs. QB1.	• Research questions, aims & objectives. • Focus group findings. • Researcher knowledge and experience. • Literature (Smith 1996, Pyne *et al.* 1999, Ocheibi and Buba 2003, Bennett *et al.* 2004, Cheng 2004 and Lappa 2005).

Sections of Questionnaire	References
Section C: Information-seeking. QC1, QC2 and QC3.	• Research aims and objectives. • Focus group findings. • Literature (Gorman 1995, Covell *et al* 1985, Elayyan 1988, Smith 1996, Nylenna & Aasland 2000, Seol *et al.* 2004, Boissin & Docsi 2005, Lappa 2005).
Section D: Information resources. QD1 - D8.	• Research aims and objectives. • Focus group findings. • Researcher knowledge and experience. • Literature (Gorman 1995, Smith 1996, Nylenna and Aasland 2000, Van Woerkum 2003, Ocheibi and Buba 2003, Boissin and Docsi 2005, Bennett *et al* 2006, Sajjad & Ramzy 2004, Doney, Barlow and West 2005, Laerum, Ellingsen and Faxvaag 2001, Ajuwon 2006).
Section E: Interpersonal communication. QE1 and QE2.	• Research aims and objectives. • Focus group findings. • Literature (Elayyan 1988, Smith 1996, Tan *et al.* 2006, Perley 2006).
Section F: Problems in obtaining information. QF1.	• Research aims and objectives. • Focus group findings. • Researcher knowledge and experience. • Literature (Covell *et al* 1985, Ocheibi and Buba 2003, Bennett *et al* 2004, Boissin & Docsi 2005, Bennett *et al* 2006).
Section G: Improving information resources and services. QG1 and QG2.	• Research aims and objectives • Focus group findings. • Literature (Doney, Barlow and West 2005).

The researcher chose some response categories from previous research to make comparisons. Three types of response format were used in the questionnaire, including open-ended. For example, most of the response categories ended with the 'other' category to allow the respondents to express themselves freely, which is useful in exploratory research. There are some limitations of this type of format such as respondents who may chose to write at length or may write only briefly. There may also be problems with the clarity of handwriting. Also, post-coding of answers is necessary and this can be time-consuming to complete. Close-ended was another type of response format used in the questionnaire. This format helps in improving response rate, the data

obtained from this type of format can be ready for analysis and respondents can recognise a response rather than remember it. However, the choices may 'lead' the respondent. The researcher must ensure all possible responses are mutually exclusive and exhaustive. Few of the questions in this research had this format of response because this research is exploratory in purpose. The third format was scaled-response. This is useful where information is difficult to quantify. It is easy to use, and items can be reworded to check reliability. But there is possible response bias (Frazer and Lawley 2000). 3-point Likert Scales were used in this research. Likert Scales are commonly used in social research. Bowling (2002, p.289) says of Likert Scales "they contain a series of option statements, usually on a 5 point scale which denote the possible range of responses". They are particularly useful for situations in which it is desired to measure respondents' perceptions or opinions. Oppenheim (2001) points to the Likert Scales as a continuum of five response statements typically ranging from 'strongly agree' to 'strongly disagree'. Nevertheless, the researcher has to make a decision regarding the range of scale. In this research, the respondents were asked to indicate, on a scale, whether they were 'satisfied' or 'dissatisfied' or 'neutral'. The researcher kept the categories few for two reasons: first of all, to make the reply categories simple and not to confuse the participants. This scale was also recommended by the results of piloting, which are explained in more detail in the next section. For instance, it was found that most respondents to the pilot study chose the middle scale. The respondents complained that a 5-point scale was very large-range scale and they preferred the 3-point range.

Finally, in this step the structure and layout of the questionnaire was determined. A well-structured questionnaire will motivate the respondents to complete it. The researcher started with a brief introduction to provide clear and simple instructions. The questions were asked clearly in a simple way without ambiguity, bias and the use of jargon or

technical language. Also, the questions were ordered in a logical way. A clean and clear appearance was also important. A readable font size (Arial sizes 10- and 11-point) was used for the questions. Italics and bold were used to emphasise key words and instructions, answer boxes were large enough to write in, questions fitted the page, sections were numbered A, B and C with exploratory section headings and questions were numbered A1, A2, B1, B2, etc to make the number of questions appear smaller. An English version of the questionnaire was administered to the respondents. The researcher found that most questionnaires done in the MOH were in English. The English language is also the study media of Kuwait education and the most common practicable language in the field of medicine.

Step four: Pre-test and revise the questionnaire.

One of the major important stages in developing the actual questionnaire is the pilot stage. The pre-test questionnaire or pilot study helps the researcher to reveal any uncertainty, which can then be corrected (Oppenheim 2001). Also, it helps in measuring the length of time required for completing the questionnaire (Mason 2002). Gillham (2000) outlined three strategies in piloting a questionnaire including: the focus or discussion group; the semi-structured interview and the semi-structured questionnaire. This study followed these three strategies. It was obvious that one objective of using the focus group data-collection technique in this study was to help in designing the semi-structured questionnaire. The questionnaire was piloted to three groups of people. The questionnaire was sent electronically to three colleagues at Loughborough University who were familiar with the area of the research. A semi-structured interview was conducted with two potential decision-makers (from the department of Healthcare Information Systems in Kuwait MOH) who reviewed the questionnaire in terms of its

practicality, and finally, a sample of 16 of the potential respondents was chosen from different study hospitals to pilot the questionnaire. The results of piloting are shown in Table 4.4.

Table 4.4: Result of pre-test questionnaire

Name Groups	Feedback
Group 1: (3 Colleagues)	• Clarified one question in section A. • Suggested adding one more category in responses list of one question in section E. • Removed some leading categories in response list of one question in section F. • Reduced the number of questions. • Added category such as 'not applicable', in some response lists. • Organized the questions by sections and subsections. • Adjusted the questionnaire layout.
Group 2: (2 decision makers)	• Reworded the Hospital Information System to Health Care Information System. • Reduced the length of some response category lists.
Group 3: (16 doctors)	• Added category 'other' in one question in section A. • Cancelled one question in section B. • Removed duplicated categories in some questions in section C. • Added one category in one question in section C. • Recommended a 3-point Likert scale. • Removed the length of response list in one question in section G. • Added 'Not applicable' category to some response lists.

Step five: Assess the reliability and validity of the questionnaire.

Upon completion of the questionnaire, it was tested for its validity and reliability. Frazer and Lawley (2000, p.35) mentioned that a "questionnaire is valid if it measures what it is supposed to measure and it is reliable if the responses are consistent and stable". Validity in this study was proved when the literature review and pilot test were completed before drafting the questionnaire. This indicated that the instrument was

applicable to the research questions, aims and objectives. Feedback from pre-testing was used to refine the questions. Ideally, one would be able to evaluate the reliability of the questionnaire. However, to compute test-retest reliability, it would be necessary to administer the questionnaire to the same sample twice (Litwin 1995). In other words, a reliable instrument is one that produces consistent results over time and place and such a step was not feasible in this study due to time limitations. However, internal consistency can be measured by using a statistical calculation called Cronbach's Coefficient, alpha, named for the 20th century psychometrician who first reported it in 1951. It is usually used to measure internal consistency reliability among a set of items combined to form a single scale. It is also reflects the homogeneity of the scale (Litwin 1995). It is an indication of the extent to which the different items complement each other in the measurement of various aspects of the same quality or variable.

4.3.2.2.4 The structure of the questionnaire

The questionnaire was divided into three main parts (A copy of questionnaire is attached in Appendix VI). The first part was the front cover, which included the study title, a brief explanation of the rationale for the study and the name of the researcher and contact details. The second part included the questionnaire content, which was divided into seven sections:

- Section A: Included A1-A9 demographic questions that would help to gather information about the respondents' gender, age, nationality, organisation (place of work) where they normally work, department, level of education, job titles, number of years' working experience since qualifying and number of years' experience in Kuwait hospitals.

- Section B: Includes question B1 which was used to explore the information needs of doctors in medical practice. The respondents were given a list of specific choices with the 'Other' category if they would like to indicate more.

- Section C: questions C1, C2 and C3 focused on examining the information-seeking of doctors in obtaining the necessary information established in section B. A list of categories, including the 'other' category, was provided to respondents in C1 and C2. However, C3 measured the use of specific resources when doctors seek information in three different scenarios. A 3-point Likert Scale was used (1=Never 2=Sometimes 3=Frequently). In addition, the 'not applicable' category (Not applicable=0) was included which helped to reduce missing responses.

- Section D: D1 to D8. This section focused on obtaining information from respondents about the use of particular information resources such as medical records, the library and the Internet. A nominal scale was used in D1, D2, D4, D5 and D6. An ordinal scale was used in D3, which listed four categories: 'daily', 'once a week', 'once a month' and 'rarely'. 'Yes' or 'No' categories were used in D6. In question D8 the respondents were asked to measure the frequency of using the library or the Internet or both by choosing from a 3-point scale (1=Never 2=Sometimes 3=Frequently). The 'not applicable' category was used.

- Section E consisted of E1 and E2. This section focused on interpersonal communication. Both questions were measured by a nominal scale.

- Section F had question F1 only. The question determined if the respondents encountered any problems in obtaining information in their organisation. This question was measured by a nominal scale. The 'other' category was included.

- Section G: the last section focused on improving information resources and services. It listed G1 and G2. Question G1 used a 3-point scale (1=Dissatisfied, 2=Neutral and 3=Satisfied) to measure the degree of participants' satisfaction with using the current information resources and services provided by their hospitals. Also 'not applicable' (Not applicable=0) was included in question G1. In G2, respondents chose one or more categories to suggest improvements to health information resources and services in Kuwait hospitals. The 'other' category was also used.

The third part of questionnaire included a statement that copies of the results will be sent to respondents, a question asking participants if they would like to be interviewed by the researcher and a message of thanks. Informed consent was attached to the questionnaire to respect the ethical issues explained in the first stage (focus group) of data collection. In addition, questionnaires were coded into four categories by using alphabetical code: F, M, A, S to distinguish between the four hospitals which helped in the analysis process.

4.3.2.3 Qualitative approach using interviews

The qualitative method of data collection was also incorporated in the third stage of the data-gathering process, through using semi-structured telephone interviews. The following section shows the detailed issues involved in this stage.

4.3.2.3.1 Rationale for using interviews

The study progressed through to the third stage of data collection, that is, interviews. The interview is the most commonly employed method in qualitative research (Bryman 2004). Bloor (2006, p.104) defined interviews as:

"The elicitation of research data through the questioning of respondents. While quantitative interviews have a semi-formal character and are conducted in surveys using a standardized interview schedule, by contrast, qualitative interviews have a more informal, conversational character, being shaped partly by the interviewer's pre-existing topic guide and partly by concerns that are emergent in the interview".

Interviews were chosen as the third stage for several reasons: firstly, the researcher was seeking in-depth details on issues that were not covered in the questionnaire. Bertrand and Hughes (2005) mentioned that interviews are an appropriate method for researchers who are seeking qualitative and descriptive in-depth data from individuals. Also, they are helpful when seeking data that is too complicated to be asked for and answered easily through questionnaires. Secondly, interviews help in reconstructing events, descriptions and feelings about current events and predictions for future developments. Bryman (2004, p.320) said that "in interviewing, going off at tangents is often encouraged". Interviews provide an insight into what the interviewee sees as relevant. This will allow the researcher to explore participant opinions. In addition, the interview is a flexible method, which allows the interviewer to adapt any schedule or guide that is being used. For example, she/he can ask new questions that follow-up interviewees' replies and can vary the order and even the wording of questions (Bryman 2004). Finally, the interview allows participants to respond on their own terms and within their own linguistic parameters, providing them and the interviewer with the opportunity to clarify meanings and share understanding (Bertrand and Hughes 2005).

On the other hand, interviews have some disadvantages, which need to be considered. Firstly, they are costly; for example, conducting one-to-one interviews consumes a large amount of research time, both in their implementation and their recording if written transcripts are needed (Gorman and Clayton 2005). Secondly, uncritical lack of selectivity means that sorting out the important points from a large quantity of data can be difficult, and may raise questions about selective reporting (Gorman and Clayton 2005). Thirdly, they may be too personal. Because interviews are face-to-face events, anonymity is lost. This may be of particular concern if potentially sensitive or embarrassing data is sought, and can, of course, lead to interviewees being tempted to lie or omit to mention some relevant facts. In other circumstances, "both interviewee and interviewer may find the experience emotionally draining" (Gorman and Clayton 2005, p.126). Finally, interviews are considered especially open to bias. The ever-present danger of bias may be overwhelming. The approach, personality and even appearance of the interviewer always has a significant effect on the quality and direction of an interview, and even on whether agreement is reached for an interview to be held at all (Gorman and Clayton 2005).

4.3.2.3.2 Type of interview

A semi-structured telephone interview was the type of interview chosen. There were some important factors considered by the researcher when deciding on the type of interview. Firstly, the nature of the research topic and the sort of data needed to respond to the research questions were important. As mentioned in previous chapters, the researcher was seeking two types of data to answer the research questions: quantitative and qualitative data. The researcher was looking for in-depth and detailed data, which could be gathered by using semi-structured interviews. In semi-structured interviews, a

list of questions or reasonably specific topics will be prepared by the researcher, often

referred to as an interview guide. However, the interviewee has a great deal of flexibility

in how to respond. In addition, the questions may not follow on exactly in the manner set

out on the schedule. Also, questions that are not included in the guide may be asked as

the interviewer picks up on things said by interviewees. But, by-and-large, all of the

questions will be asked and a similar wording will be used from interviewee to

interviewee (Bryman 2004). Other important factors considered were time and cost.

Telephone interviews were selected for that reason. This saved time by allowing the

researcher to collect data over a large geographic area, which also helped to save on

travel costs (Oppenheim 2001, Bourque and Fielder 2003).

4.3.2.3.3 Interview sampling

A combination of convenience sampling and quota sampling methods was used to

choose participants for the interviews. Fink (2003) explained that quota sampling divides

the study population into subgroups, such as by gender or age, and subsequently, the

researcher estimates the proportion of participants in each subgroup. This method was

chosen for the following reasons: firstly, the population elements were selected on the

basis of their availability, that is, because they volunteered. Secondly, the researcher

arranged the participants into four units based on the name of the hospital, in which they

worked, and then a judgment was taken by the researcher to choose from the list of

volunteers (168 volunteers) those who had appropriate characteristics that reflected the

research questions, aims, objectives and also the questionnaire results. This method was

appropriate to the researcher's situation in terms of time, geographical area and the

accessibility of the participants.

4.3.2.3.4 Designing the interview guide

The researcher developed an interview guide, providing a list of probes and prompts appropriate to the areas to be covered. In addition, it reduced the interviewer's stress in running the telephone interview by organizing the interview in a smooth and semi-systematic manner. The interview guide (attached in Appendix VII) consisted of three main sections. The first section was the introductory part, which included the welcome statement, ice-breaker and a review of the research subject's interest. The second section included the four principle topics to be covered in the interview, in addition to the prompts for the subjects covered. The main topics were the following:

- Doctors' information needs for medical practice.
- Use of health Information sources such as personal collection, Internet, library and interpersonal communication.
- Problems in obtaining information they need for their medical practice.
- Suggestions in improving information provision in Kuwait government hospitals.

Then, in the last section, the interview is concluded by asking the interviewees if they would like to add or discuss any issues related to the interview subject. It also included a statement of thanks. Generally, the structure of the interview guide was the same for each interview but the probes and prompt questions were different from one interview to another. That is because in semi-structured interviews, the interviewer asks questions of each participant in a systematic and consistent order, but with some freedom for the interviewer to digress and probe.

Bryman (2004, p.324) listed some key elements in preparing an interview guide:

- Create a certain degree of order for the subject areas, so that the questions about them flow reasonably well, but be prepared to alter the order of questions during the actual interview;

- Create interview questions or topics in a way that will help the interviewer to answer his/her research questions;

- Use a language that is understandable and relevant to the interviewees.

- In interviewing, as in quantitative research, do not ask leading questions;

- The interviewer should ensure that she/he asks or records "fact-sheet" information of a general kind (e.g. age, gender) and a specific kind (e.g. position in company, number of years employed, number of years involved in group) because such information is useful for contextualizing people's answers.

4.3.2.3.5 Pre-test interview guide

The interview guide was validated by the researcher's supervisors in Loughborough University in the UK. In addition, the researcher pre-tested the guide with one male doctor who worked in the Internal Medicine Department at Al Farwania hospital. They suggested minor changes. These were mostly concerned with the type of questions and language used. For example, some questions were avoided because they were leading questions. Also, the final version of the guide used 'seeking information' rather than 'obtaining information' and 'resources' instead of 'collection'. The quality of the digital audiotape was also tested.

4.3.2.3.6 Conducting the interviews

The interviews were conducted over a period of two weeks in April 2008. Emails were sent to all participants (168 volunteers) one week before to remind them of the research subject and to thank them for their contribution. Also the researcher asked the volunteers if they would still like to be interviewed. After the researcher received the replies from the participants, another email was sent to confirm the date and time of the interviews. Twenty doctors were chosen from a total of 76 respondents to participate in interviews. The researcher conducted 1 to 2 interviews each day, because the participants indicated that the most appropriate time for interviewing was from 1:00 p.m. to 2:00 p.m. Each interview took 30 to 45 minutes. The digital audiotape was pre-tested to determine any recording problems before the interview started. The same ethical issues that were considered in both stages one and two of the data collection were considered again in the interview process. In addition, another copy of the informed consent form was sent to all the participants by email, and the participants sent their reply by fax. Mahon, Conlon and Dillon (1998) pointed out that ethical issues should be addressed at each stage of data collection including ways of overcoming any that arise.

4.4 Analysis methods

Onwuegbuzie and Teddlie (2003, p.35) considered the analysis method for sequential mixed studies, in which "multiple approaches to data collection, analysis, and inference are employed in a sequence of phases". The analysis of data often occurs before all of the data have been collected. As stated above, this research followed the sequential mixed-method approach in which the analysis of data takes place in a sequential manner, as shown in Figure 4.2.

Qualitative data collection		Quantitative data collection		Qualitative data collection
Qualitative data analysis	→	**Quantitative data analysis**	→	**Qualitative data analysis**
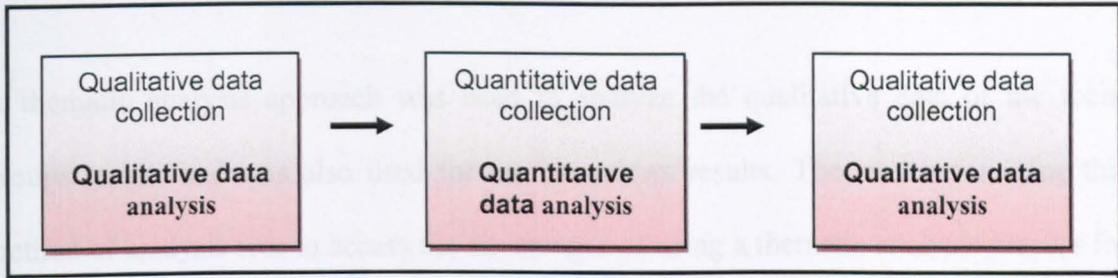
ure 4.2: A sequential mixed-methods data analysis

The data analysis decision was made according to some key points listed by Onwuegbuzie and Teddlie (2003). Firstly, they refer to the purpose of the mixed-methods research. In this research, the purpose of the mixed-methods approach is initiation, then both qualitative and quantitative data types should be used, and a sequential mixed analysis is appropriate. Secondly, based on the type of data and the purpose of the research, both exploratory analysis (e.g. thematic analysis and descriptive statistics) and confirmatory data analysis techniques (e.g. chi-square) were needed. An exploratory approach is suitable for the analysis of the qualitative data and sometimes the quantitative data. However, a confirmatory approach is usually used for quantitative data to increase the credibility of the results (Onwuegbuzie and Teddlie 2003). Finally, the data analysis is in a certain order, termed sequential qualitative-quantitative-qualitative. Each stage is built from the preceding stage. Then the results from each type of data analysis are compared and consolidated.

According to the previous decisions, in this research both qualitative and quantitative types of data were obtained. Each of them was analysed separately and sequentially, using different approaches. This is discussed in greater detail in the next section.

4.4.1 Qualitative data analysis

A thematic analysis approach was used to analyze the qualitative data of the focus groups results and was also used for the interviews results. The reason for using this method of analysis was to access the advantages of using a thematic analysis process for the focus group stage. In addition, the researcher used the same method of analyzing the qualitative data to improve the consistency of the results.

Thematic analysis is a process commonly used with qualitative data. "It is the process for encoding qualitative information" (Boyatzis 1998, p.4). It is the process of identifying, analyzing and reporting patterns (themes) within data (Boyatzis 1998). There are two main approaches in thematic analysis: inductive and deductive (Boyatzis 1998 and Braun and Clarke 2006). In an inductive approach, if the data has been collected specifically for the research (e.g., via interview or focus group), the themes identified may bear little relation to the specific questions that were asked of the participants. Inductive analysis is therefore a process of coding the data without trying to fit it into a pre-existing coding frame, or the researcher's analytic preconceptions (Boyatzis 1998 and Braun and Clarke 2006). In this sense, this form of thematic analysis is data-driven. In contrast, a deductive thematic analysis would tend to be driven by the researcher's theoretical or analytic interest in the area, and is thus more explicitly analyst driven. This form of thematic analysis tends to provide less rich description of the data overall, and a more detailed analysis of some aspects of the data (Boyatzis 1998 and Braun and Clarke 2006).

There were some advantages of thematic analysis indicated by Boyatzis (1998, p.5). It allows researchers to use a variety of types of information in a systematic manner, which helps in increasing the accuracy in understanding and interpretation. It can be useful for all stages of the research. For example, it can be used as a pilot stage. It provides a "vehicle for increasing communication in ways that researchers using various methods can appreciate" Boyatzis (1998, p.5). Also, Braun and Clarke (2006, p.97) outlined the advantages of the thematic analysis as: a) It is a flexible method. b) It is a simple method and not complex and quick to learn and do. c) It is accessible to researchers who lack the experience of qualitative research. d) "Results are generally accessible to the educated general public". e) It is a useful "method for working within a participatory research paradigm, with participants as collaborators". f) It is a useful method to help in summarizing key factors of a large body of data and provides a deep and wide description of the data set. g) It is a good method of making comparisons by highlighting similarities and differences across the data set. h) It can create unexpected insights. i) It is used for interpretations of both social and psychological data. j) It is a useful method for generating qualitative analyses that can assist in developing and informing policy.

Although thematic analysis has many advantages, as for any method, it has some disadvantages. One of the most obvious is that it provides wide, broad, data, which makes it difficult for researchers to control the data analysis and decide on which aspect of data they should focus. Another issue of great importance is that thematic analysis has limited interpretive power if it is not used within the theoretical framework that supports the analytic claims being made.

Other defects appear when thematic analysis is the objective for some other methods of qualitative analysis. For example, in contrast to the narrative approach, the researcher

may be unable to retain a sense of continuity and contradiction from any one account, and these contradictions and inconsistencies in the scope of individual accounts may be revealing. Also, thematic analysis, unlike DA (disclosure analysis) and CA (content analysis), enables the researchers to make arguments about language use or the fine-gained functionally of speech.

Braun and Clark (2006, p.87) suggested six stages in doing thematic analysis. In this research, the six stages were used, as explained in more detail in the next section.

Phase 1: Familiarizing yourself with your data: The researcher and assistant reviewed the notes that were taken by the assistant in each focus group. The notes were typed by the assistant using Microsoft Word; this helped the researcher to read the notes clearly. The tapes were checked for clarity and flow of discussion, and then each tape was transcribed by the researcher. The researcher listened to the digital tapes, read and re-read the data, marking ideas for coding and summarizing the data. This was an important stage for the researcher to familiarize herself with the data. The researcher used digital tape to record the telephone interviews. The researcher transcribed each interview by hand, and then each interview was typed out using Microsoft Word. Then again, the researcher read and re-read each interview to familiarize herself with the data.

Phase 2: Generating initial codes. Codes identify a feature of the data that appears interesting to the analyst, and refer to the "most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon" (Boyatzis 1998, p.63). An initial set of codes was developed from the data of the focus groups and semi-structured telephone interviews. The researcher collated data relevant to each code. Table 4.5 shows the process of identifying codes.

Table 4.5: Example of generating initial codes for research data

Participant ID	Data Extract	Codes
B5	For me OPD because patient comes with full in a good way, no rush, you have your desk, you have your nurse, you can talk with children, parents in OPD everything is around you.	• Quiet Environment. • Facilities (desk, staff). • Communicating with patients' parents.

Phase 3: Searching for themes: after all the data have been coded and collated, themes

and sub-themes are investigated. This involves "sorting the different codes into potential

themes and collating all the relevant coded data extracts within the identified themes"

(Braun & Clarke 2006, p.89). The researcher collected all relevant codes into potential

themes and drew all these elements into a visual representation, 'a thematic map' the

better to explore them. Figure 4.3 shows the thematic map of the data.
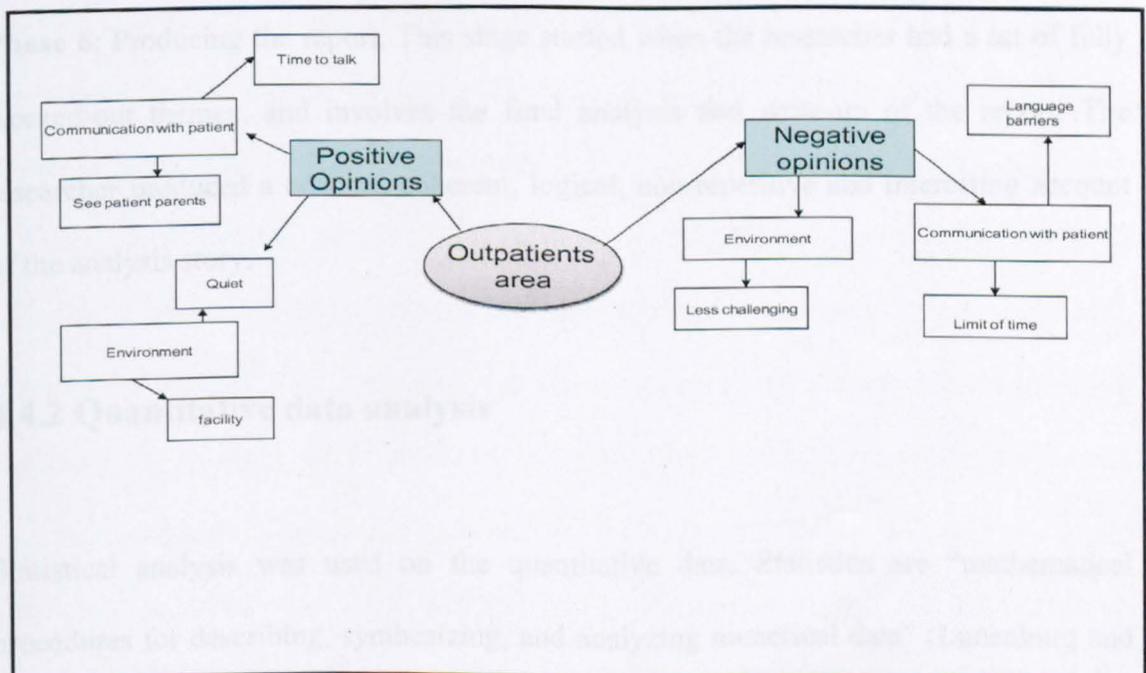
Figure 4.3: One portion of the thematic map of the research data

Some themes were new and identified from the codes and data extracts, other themes were driven by the focus group questions and the research aims and objectives. Also, all the themes used in the interviews data were from the research questions, aims and objectives and also from the questionnaire. However, some new sub-themes emerged from the interview data. Then, the researcher collected all relevant codes into potential themes.

Phase 4: Reviewing themes. In this stage the researcher made sure that the themes related to the coded extracts and the data set. The researcher read all the themes and codes and reviewed them to see if they appeared in a coherent pattern.

Phase 5: Defining and naming themes. This involves continuing analysis to refine the specifics of each theme and the overall story the analysis tells. It also involves generating clear definitions and names for each theme. Thus, the researcher 'defines and refines'; by identifying the core of each theme, and determining what aspect of the data each theme captures, in order to conduct a detailed analysis of the data in question.

Phase 6: Producing the report. This stage started when the researcher had a set of fully worked-out themes, and involves the final analysis and write-up of the report. The researcher produced a concise, coherent, logical, non-repetitive and interesting account of the analysis story.

4.4.2 Quantitative data analysis

Statistical analysis was used on the quantitative data. Statistics are "mathematical procedures for describing, synthesizing, and analyzing numerical data" (Lunenburg and Irby 2008, p.62). According to the research questions, aims, objectives and type of data,

two kinds of statistical procedures were required: descriptive statistics and nonparametric statistics. Descriptive statistics are a type of mathematical procedure which is used for organising and summarizing numerical data (Lunenburg and Irby 2008). However, nonparametric statistics refers to inferential statistics that make very weak assumptions about the characteristics of the population from which the data came (Howitt and Cramer 2005). In this research, descriptive statistics, such as frequencies and percentages, were used to describe the categories and continuous variables and to show the number of respondents that gave each response. On the other hand, non-parametric statistical tests, such as the chi-square test, which is a common test used in user studies in the library and information field, were used. It is an appropriate test for data presented in the form of frequency accounts or percentages and proportions that can be converted into frequencies (Gay, Mills and Airasian 2006). It can be used to test the statistical relationship between variables (Howitt and Cramer 2005).

A large amount of data was collected by the questionnaire, thus, using a computer data analysis package, the Statistical Package for the Social Sciences (SPSS,) was an ideal way to manage and analyse this data. This powerful statistical and data analysis software covers a basic range of various parametric and non-parametric tests and regression techniques: Multivariate analysis and Survival analysis (Howitt and Cramer 2005). In addition, using this software provides several advantages including reducing the time required to analyse data, reducing the errors involved in coding data, thoroughly analysing data with in-depth statistics and charts and presenting results clearly with flexible reports and charts. The data in this research were coded and processed into SPSS. The presentation of the results follows the framework themes and sub-themes of the analysis process of the focus groups as well as the order of the questions in the questionnaire. In addition, some graphs were used to describe and explore the data more

clearly. Cross tables were used to present the distribution of two variables more directly and clearly. A multiple response table was used to manage questions with multiple responses. In addition, graphs such as bar graphs and line graphs, which are often utilized for descriptive statistics, were used to improve the presentation of the data (Pallant 2007). For example, bar graphs were used to show the number of respondents in particular categories and a line graph was used to explain results of two-way analysis. Finally, the Cronbach alpha coefficient test was used to measure the reliability by measuring the internal consistency for the Likert scale (Vaughan 2001).

4.5 Methodological Limitations

Nearly all research projects are confronted with various kinds of constraints in research design and methodology. In this context, it is important to outline the limitations encountered in each stage of the data collection.

- Generally, all stages encountered administration bureaucracy. The researcher waited around one month and a half to obtain agreement to conduct the research in Kuwait hospitals from the Standing Committee for the Coordination of Health and Medical Research in the Kuwait Ministry of Health. Then, the researcher waited the official letter (see Appendix VIII) of agreement from the committee to circulate to all healthcare regions, then to all directors of the selected hospitals who then also informed all heads of departments in clinical areas.

- In particular, the focus groups were limited due to the time limitations and recruiting difficulties, the sample size was small. The total number of participants was 13 doctors working only in three hospitals: Mubarak Al Kabeer,

Al Sabah and Al Farwania. Al Amiri was excluded from this stage of the study because of time constraints.

- Although the composition of the focus groups consisted of Senior Registrar, Registrar, Assistant Registrar, Senior Specialist and Specialist, no Senior Specialists or Specialists participated in or attended this study. Also no female Kuwaitis attended, thus it is possible that some opinions are missing which may affect the quality of the data.

- The time for the focus groups was limited. Only one hour was allowed by the heads of departments, either in the morning after the round meeting or when doctors finished in the outpatient area. Consequently, some issues were not raised, such as the experience of doctors in using the Internet and Healthcare Information System. More details about their personal and departmental collections could have been obtained.

- Some of the participants in the focus groups agreed all the time with their colleagues. This indicated that the participants who were interested in the subject might have influenced others' perceptions and opinions.

- A number of participants in the questionnaires were unwilling to participate due to reasons such as lack of interest, busy schedules, and missing information e.g. no name and contact number on some returned questionnaires. For example, the head of the Dermatology Department in Al Farwania hospital refused to distribute the questionnaire in his department because he was not interested in contributing to survey studies. In addition, some questionnaires were removed because they had a lot of missing data.

- Although the researcher chose the telephone interview for such advantages as saving travel costs, there were some limitations such as the high cost of international calls and also the recordings of the voices of the participants were sometimes not clear, with the result that some data were removed from the interviews.

- Because this PhD research has been restricted with a limit time of duration and the researcher wanted to explore the more detailed issues in the government hospitals, which is the most interesting area found in the literature, the exploration of private sector hospitals was excluded from this research.

- Finally, using the mixed-method approach proved to be very beneficial in understanding the research phenomena, however, it was time-consuming, required much effort and was costly because of its sequential nature. In fact, two field trips were undertaken and only one could be sponsor-funded.

4.6 Summary

The primary goal of this study was to test the research questions that related to information needs and seeking of doctors in Kuwait government hospitals. The methodology employed to test the research questions, aims and objectives is presented in this chapter. This study employed a sequential mixed approach using both qualitative and quantitative methods. The data were collected through three stages in a sequential manner: focus groups, semi-structured questionnaires and semi-structured telephone interviews. The focus groups were used as a preliminary stage of data collection to clarify issues and identify any relevant points that did not emerge from the literature review. The results of the focus groups, along with findings from an analysis of the

relevant literature, were used as the basis for the development of a questionnaire. The study then progressed by conducting semi-structured telephone interviews to provide more details of issues uncovered in the questionnaire. Some ethical issues were considered at each stage. The interpretation of each stage of the findings was performed separately in a sequential way before collecting all the stages. Several analysis techniques were used to interpret the three stages. The finding of each stage is presented separately in the following three chapters.

Chapter Five

Result Stage One: Focus Groups

5.0 Introduction

This chapter reports the findings of the first stage data collation obtained by using focus group data-gathering techniques. The chapter starts with section one which demonstrates the participants' profile information and general information. The second section presents the first theme about the information needs of participants. Section three explains the information-seeking theme, which was divided into two contextual sub-themes: scenarios and sources. The fourth section indicates the criteria participants considered when they seek health information. The following two sections show the satisfaction of participants when using the current information sources and services in Kuwait government hospitals and also the barriers they encountered when they are

seeking the information needed. The last section lists the participants' suggestions and opinions for improving the current information provision services. The chapter concludes with a summary of the key findings of the focus groups stage.

5.1 Participants' demographics and general information

There were three focus group sessions conducted in three hospitals. The first one was conducted in the Department of Internal Medicine at Al Sabah hospital (5 participants). The second focus group was undertaken in the Department of Paediatric Medicine at Mubarak hospital (5 participants), and the third group was in the Department of Surgery at Al Farwania hospital (6 participants). Sixteen participants attended the focus groups. However, three of them apologized and left when the meetings started, giving a total of 13 participants in all three groups.

Table 5.1 (see Page 192) gives the demographic profile of the participants. Most of the participants were male. Only two females attended. The number of Non-Kuwaiti (NK) doctors is greater than the number of Kuwaitis (K). The participants' ages ranged from 26 to 51. Most of the participants had Master's degree because most of them had job titles registrars.

Table 5.1: Demographic data of the focus groups participants

User ID	Hospital	Department	Gender	Age	Nationality	Education	Job Title	Working Experience
1	Al Sabah	Internal Medicine (IM)	M	51	NK	MRCP(Membership of Royal College of Physicians)	SR(Senior Registrar)	25
2	Al Sabah	IM	M	39	NK	Master	R(Registrar)	15
3	Al Sabah	IM	M	50	NK	MRCP	AR(Assistant Registrar)	20
4	Al Sabah	IM	M	46	NK	Master	SR	22
5	Mubarak	Paediatric	M	43	NK	Master	R	18
6	Mubarak	Paediatric	M	35	NK	Master	SR	13
7	Mubarak	Paediatric	F	32	NK	Master	R	9
8	Mubarak	Paediatric	F	40	NK	Master	R	15
9	Al Farwania	Surgical	M	30	K	Bachelor	AR	2
10	Al Farwania	Surgical	M	31	K	Master	R	7
11	Al Farwania	Surgical	M	36	K	PhD	SR	10
12	Al Farwania	Surgical	M	28	K	Master	R	5
13	Al Farwania	Surgical	M	26	K	Bachelor	AR	2

5.2 Theme one: information needs

There were different opinions from participants regarding their information needs. However most of them said the nature of their profession required them to be up-to-date with new information such as uncommon diseases and new drugs. Also, they need information to improve their knowledge. In addition, some participants emphasized the need for information to write reports and make case studies. One participant in Al Farwania said that they needed:

"Information for our consultation and research, searching for
case studies and reports".

Some participants said that they need information to make clinical decisions and provide good healthcare for patients. In addition, some participants needed information to communicate with colleagues such as junior doctors and answer their questions.

"As you move up and become senior and are in the position of a decision-maker then you should always be up-to-date with information" (Participant, Al Sabah hospital).

5.3 Theme two: information seeking behaviour

Most of the participants indicated that they usually seek patient data and knowledge information.

"I need information about principle diagnosis if the patient referral is from poly clinics;
demographic data such as age and gender;
any history data, for example, if he/she smoker, diabetic, had previous surgery and
allergy" (Participant, Al Farwania Hospital).

Other participants mentioned an example of knowledge information, for instance they looked for information about new drugs and treatment.

"Old type fevers and new type fevers have different treatments" (Participant, Mubarak hospitals).

A few of the participants indicated that they need information about their departmental guidelines, policies and protocols. The participants indicated that they sought information from different sources in different contexts. These are divided into the following two sub-themes:

5.3.1 Seeking information in clinical areas

Participants from the three hospitals indicated three main areas where they met patients: outpatient departments, emergency rooms and wards. Some of the participants added another area, the day case unit. A participant in Al Sabah hospital provided more details on how they meet the patients in different locations, he said:

" Usually there are two places, either medical casualty or medical outpatients. But mainly in the casualty and the outpatients are the patients who are referred from the clinics or the ones discharged from the wards who have come for follow-ups. In the wards we are seeing in-patients who are admitted to the wards".

Also, some participants pointed out that their role in the ER area is to provide consultations for admitting patients.

"The emergency rooms in all hospitals now in Kuwait for the past four or five years have a new situation. I mean that now the emergency room team is separate from the medical ward team.

If they think that they need either a second opinion to manage the patient or an opinion to admit the patient to the ward they call us " (Participant, Al Sabah hospital).

Participants identified the information sources they usually obtain when they see patients in the three clinical scenarios. In the outpatients, most participants stated they frequently gathered information from patients or sometimes from the patient's parents and any person who came with the patients such as the maid/nanny and friends.

"In the outpatient area it's mainly the patient himself because the patient is usually fully conscious and fully oriented and usually coming by himself or sometimes with one companion. So, the patient is the main source of information (Participant, Al Sabah hospital).

Another source of information also mentioned by some participants was the patient's files and medical reports. One participant in Al Sabah hospital provided a scenario of the procedures for gathering information when he sees patients in the outpatient area. He mentioned two types of patient; new or old patients, saying:

"We have two types of patients. A new patient who is coming for the first time. These new patients are new from the name so you have to go thoroughly through his main problem, why they were referred to the hospital, and for the first time the patient will get a full medical examination on the couch and everything is checked for him. You will decide after that which investigation this particular patient needs. The other type of patient is the regular patient who is coming for follow-up. These are the routine follow-up patients unless the patient has some new problem. Then you have to go through the new problem and investigate it in the usual way".

The participants also added another source of information; they said sometimes they sought information by asking colleagues. Colleagues can be senior registrars and consultants. One participant in Al Farwania hospital noted:

"During the daytime we ask other doctors, colleagues, sit in meetings or call our colleagues on the phone if they are not available".

In the ward area, participants identified sources for seeking information. They indicated that they sought information from the patient, the patient's parents/relatives/maid, by doing an examination, discussing the patient with their colleagues and requesting more investigations or tests to diagnose the patients. Some participants in Mubarak hospital pointed out that in the ward area, they gather information from the same sources that they use in the OPD. One participant in Al Farwania added that they gather information by asking nurses in wards.

In addition, most of the participants reported that they exhaust all sources of information available in emergency rooms. They frequently asked patients or anybody coming with the patients and colleagues. Some participants added that sometimes they ask ambulance staff. One participant in Mubarak said:

"Ambulance information is collected. Because in an emergency most of the time the patients are unconscious or not able to speak, we seek information from the person who accompanied him on board the ambulance or the ambulance staff".

One participant from Mubarak hospital said that ER is a stimulating area to explore new information. He said:

"I found emergency a challenging place, with new admission cases. When you consult a new patient there are chances to get some new information regarding a disease".

5.3.2 Clinical information sources

Besides the interpersonal communication (e.g. asking patients, patients' next of kin, colleagues, nurses) and patients' files which have been mentioned as sources of

information sought by participants in the three clinical scenarios, other information sources were also specified by participants for their information needs.

Printed materials

Textbooks were revealed by a few of the participants as a source of information as well as printed medical journals. One participant in Al Farwania hospital said:

"Sometimes, I look at books and medical journals".

Electronic resources

Most participants reported that they usually sought information from online electronic resources such as searching medical websites and the Internet. Also, some of them listed examples of online medical databases.

"We browse through the Internet such as we go to
PubMed, MedLine, WebMed, eMedicine" (Participant, Mubarak hospital).

Hospital Libraries and other Libraries

Participants in Mubarak hospital and Al Sabah hospital revealed that they do not have a hospital library. However, participants in Al Farwania hospital stated they have a small library in the hospital. Also, most of the participants mentioned that they visited other libraries outside the hospital, such as the Health Sciences Centre Library in Kuwait University. Participants in Mubarak hospital pointed out that they were lucky because the library is attached to their hospital.

" Sometimes I use Kuwait University's library, two steps from our hospital. This library is well organized and most of our requirements are fulfilled".

Participants were probed on the type of resources they sought in the libraries. Most of them mentioned serials such as periodicals and journals. Some of them said they seek books, databases and the Internet.

Personal collection

Most of the participants indicated that they have a personal collection such as books, and electronic resources such as subscriptions to online journals and databases. For example, one participant in Al Farwania hospital said:

"I have my laptop with wireless connection to the Internet".

Departmental collection

Some of the participants revealed that they have a ward library. This library was developed by ward staff (doctors and nurses) and contained their own collections.

" We have the ward library here. This is each doctor's personal collection" (Participant, Al Sabah hospital).

Telephone and cell phone

Telephones and cell phones were reported by many participants as methods of getting information. One participant in Al Sabah hospital pointed out that he used his mobile to ask his colleagues for second opinions He said:

"Now, if we need some information from another hospital we use our personal mobiles to communicate and share information".

One participant from Mubarak hospital indicated that she used her phone to call children's parents if she needs more information. She said:

" Those parents who are reluctant to come back to hospital for follow up, we ask them by phone about their kid's problems".

Communication with other hospitals

Some participants added that sometimes they call colleagues in other hospitals as a useful source of information.

"We also ask other hospitals like Kuwait Cancer Care Center if it is a cancer case or other surgeons if it is related to their field" (Participant, Al Farwania hospital).

Seminars, Lectures and Meetings

Attending seminars, lectures and meetings (e.g. journal clubs) inside and outside the hospitals were sources of information used by participants in all hospitals.

"We also have clinical meetings outside hospitals like in the ministry, university the medical school. Usually these types of meetings are very informative. It's very helpful because they will give up-to-date information" (Participant, Al Sabah hospital).

5.4 Theme three: criteria for choosing clinical information

Participants provided different criteria for choosing the clinical information they needed. They indicated they always look for precise, organised and clinical-based evidence and

information. Also, when they consulted their colleagues, they chose experienced colleagues.

" For the journals we generally use indexed journals. We use these respected and well-known journals because they have a high standard for establishing a finding or investigation. So these are the ones we usually refer to " (Participant, Al Farwania hospital).

5.5 Theme Four: Information satisfaction

Participants discussed their satisfaction with current information resources and services. Their opinions are categorized in the following sub-themes:

5.5.1 Communication with patient

The first issue indicated by participants was related to their communication with patients in the three clinical scenarios. They had different opinions about that. However, one participant from the Al Farwania hospital pointed out:

"It's not a matter of favourite. It's the way the work is organized. Some patients come to the OPD and some to the emergency. Usually in the OPD the situation is more relaxed, more calm, and usually the patient is not sick and supposedly it is a more relaxed place. Some may argue that it's very crowded and very busy".

The participants provided different reasons for satisfaction or dissatisfaction in areas where they see patients. Some preferred the Outpatient area because it is a quiet environment, they can communicate with the patient and get the information they need, and because it is fully equipped with assistant staff and a desk.

"For me, because there is no rush, you have your desk you have your nurse, you can talk with patients or children's parents. In OPD everything is around you" (Participant, Mubarak hospital).

In contrast, some participants do not particularly like outpatients because it is a crowded area and this means that the doctors do not have enough time to communicate with the patients.

Participants who preferred to meet patients in the Emergency Room (ER) indicated multiple reasons such as the fact that it is a less stressed area because patients come without an appointment, they can communicate with patients and take the information they need, they can order investigations and tests and receive the results in a short time. In contrast, some participants mentioned disadvantages of communication with patients in the ER area because it is a crowded area and time to communicate is limited. Also, they sometimes faced difficulties in gathering information from unconscious patients.

Most participants reported that the wards were a good place to communicate with patients and collect necessary information such as patient history and investigation information. For example, one participant in Al Sabah hospital said:

"In wards you can talk more with patients and ask more details. More investigations may be done and so there is a possibility of a different diagnosis".

However, one participant in Mubarak hospital found that it was difficult to communicate with patients in the wards, particularly if the patients' parents or relations were involved.

"In the ward, the father goes out and you need information from the children's parents and it is difficult to find them".

5.5.2 Accessibility of the Internet

Most of the participants were dissatisfied with the accessibility of the Internet in their hospitals. For example, participants in Mubarak hospital mentioned that they have the Internet on the wards but it is not accessible all day. Some of them indicated that the Internet is available in some areas, particularly the offices of the heads of departments.

5.5.3 Services provided by other departments

Participants showed their dissatisfaction with services provided by the libraries. Some participants were dissatisfied with the working hours of the library.

"If there is an emergency case during the night time and I need to consult the library in the health sciences faculty, it's closed" (Participant, Mubarak hospital).

Participants in Al Farwania hospital were dissatisfied with the hospital library because of the dated and small collection. They said:

"We have a hospital library, but we don't visit the library, they have an ancient collection".

Also, some participants were dissatisfied with services provided by the medical record department. They were disappointed with the filing system's problems such as missing files and incomplete information.

"Files may be lost, which is a big failure. Sometimes they find the file but data is missing, I mean sheets from the file are missing" (Participant, Al Sabah hospital).

5.6 Theme five: barriers in obtaining information

Participants in the three hospitals reported some problems in obtaining the information they need. They were:

5.6.1 Language barriers

A language barrier was a common problem with all participants. Participants had problems in communicating with some patients who could not speak Arabic or English.

"The important thing is the time and the language of the patient. We face many difficulties when taking history from an Indian patient. Sometimes we need help from the nurses or the porter just to translate the language" (Participant, Al Sabah hospital).

5.6.2 Time constraints

Another problem was that participants need time to communicate with patients and they also need to get investigation results quickly.

" Mostly, when we're dealing with patients we need time. Time to deal with patients. Like when we order ultrasound we need time to wait for the results; and this is what the patients are requesting from us...time; and proper management. Most of the time we cannot give proper management without having everything ready" (Participant, Al Farwania hospital).

5.6.3 Healthcare Information System (HCIS)

Participants in Al Farwania faced problems when using the hospital information system (HCIS) such as the system going down and incomplete information. They said:

"So, I think we have a problem with the system. And when the system is going down, the medical staff also loses performance and is going down".

5.6.4 Paper-based patient medical record

Another issue was problems with using the paper-based patient medical records such as unorganized information, missing files, duplication of information and inaccessibility of the files.

"There is another problem here. The problem is that the patients' files are very badly maintained. The information in the file is not even chronologically maintained. The inpatient, outpatient, notes are all shown together" (Participant, Al Sabah hospital).

5.6.5 Inaccessibility of the Internet

Also, participants indicated that inaccessibility of the Internet was a big problem they faced. They mentioned that the Internet is available in some places in the hospital and it is very slow. They also do not have a subscription to online medical journals through the hospital Internet.

5.6.6 Gathering information from patients/parents/maids

Finally, the participants cited one more problem in gathering information from patients and patients' parents/relatives/maids. They said that sometimes the patients or those who come with patients are not cooperative in providing them with the information needed to help diagnose the patient such as the medical history of the patients and if the patient is

taking some specific medication. Also, some of the child patients come in with maids who have a lack of awareness of the children's conditions and medical history.

" Sometimes, patients are afraid to tell the actual situation.
Most parents hide the actual problem and say he was all right when he was at home, the parents deny to answer such question. Most of the patients or parents hide their chronic or serious problems" (Participant, Mubarak hospital).

5.7 Theme six: suggestions for improvements

Participants in all three hospitals provided different suggestions for improving current information resources and information services.

- Provide Internet and Intranet: They recommended Internet access from all areas in the hospital. Also, they suggested enhancing the communication with other hospitals by providing Intranet connections.

" Communication between the hospitals should be improved. Actually we are keen to improve communication between hospitals. There should be a dedicated Internet line" (Participant, Al Sabah hospital).

- They need hospital libraries and research centres. For example a participant in Mubarak hospital said:

" We should have a library in the hospital too. Besides Internet access in the ward, which is only in a few places, we don't have other searching tools in the ward".

- Improve communication with their colleagues by providing mobiles and emails from the Ministry of Health.

- Solve the problem of language barriers with patients by providing translators from the Ministry of Health.

- They felt that cooperation was important for improving information services in the hospital. They need the patient and any person coming with the patient to be more cooperative in providing the information they need. For example one participant in Mubarak hospital said

  " Cooperation is the best key in OPD, wards and ER. This way we make patients so friendly that they tell us all about the problems ".

- Health education for patients, patients' next of kin and any person coming with patient. This could be achieved by providing seminars and leaflets. One participant in Al Farwania hospital suggested:

  " Health education for patient and parents. Give them some seminars to understand their children cases, some leaflets. "

- Develop a proper infrastructure for the digital health information system.

  "I think it is a system problem. And this problem exists in all the ministry hospitals. We need to have a proper infrastructure for digital filing. We need to have a proper infrastructure for digital information like the library, the Internet" (Participant, Al Farwania hospital).

- Time management to communicate with the patient. They need to see only the required number of patients who had legal and documented appointments.

- Update some forms in the patients' files.

  " There is need to update discharge and summary reports, list of patients and recent investigations" (Participant, Al Farwania hospital).

- Laboratory and other investigation departments should send results quickly.

- Also, motivating doctors to follow their patient and improve their knowledge by reading. One participant in Al Farwania said:

"We need to give the doctor the motivation to go and read and enjoy his reading for the patient".

- Finally, improve the service of the medical record department by assigning professional staff, finding missing files and updating file forms such as discharge and summary reports.

" The people in the filing section should be professional people. The filing section people should be professionals in the arrangement of the records within the file, and the filing people should be available around the hour just like any other staff working 24/h" (Participant, Al Sabah hospital).

5.8 Summary

Three focus groups were convened across three general government hospitals in Kuwait. The key findings of the focus groups were that participants indicated the type of information they need: patient data, knowledge and legal information about their department. They need information for several reasons; however, the main reason was to keep up with current issues in their specialties. The information-seeking process occurs in two contexts: first, through their communication with patients in the three clinical areas and also by seeking different channels of information. The results showed that the Emergency department is a separate unit and it includes specific staff, however, the

participants' role was to provide consultations, particularly for admitting patients to the hospital.

Interpersonal communication and patient files were the information sources used most by participants when they communicated with patients in the three clinical scenarios. Also, there were other information sources sought by participants and the most frequently mentioned sources were the Internet and personal collections. It found that colleagues were the most usual intermediary channel used by participants to assist them in seeking information. Reliability and up-to-date information were considered by participants when they seek information from online resources.

Most participants were dissatisfied with the information provision services in their hospital and the most common ones indicated were communication with the patient and the accessibility of the Internet. In addition, they often had problems in obtaining the information they need and the most mentioned were: language barriers, time constraints in their communications with patients; inaccessibility of the Internet; and gathering information from unauthorized sources such as maids. Lastly, the participants suggested some effective solutions for improving the current information resources and services and the most surprising suggestion was health education for patients.

The focus groups provided key factors for the study results and also some of the principle categories for the questionnaire design. More potential findings from a large sample of participants were found in the questionnaire results in the next chapter.

Chapter Six

Result Stage Two: Questionnaire

6.0 Introduction

This chapter illustrates the results of the second stage of data collection using a semi-structured questionnaire. As indicated in chapter three, SPSS was used to analyse the results using descriptive statistics such as frequency distribution and percentages. Also, nonparametric tests such as Chi Square were used to examine the significant relationships between variables. The results are presented here according to research aims and objectives and focus group themes.

6.1 Questionnaire administration process and response rates

The researcher started distributing the questionnaire on January 2, 2008, spending 2 to 3 days in each of the selected hospitals, before moving on to the next. The collection of the questionnaires was completed by February 2, 2008. The distributed questionnaires totalled 1,000 and there were 541 (54%) usable returns. This total number excluded incomplete questionnaires, and those completed by medical students and doctors working in hospitals outside the study. Table 6.1 presents the response rate by hospital.

Table 6.1: Questionnaire response rate in the four hospitals

Name of Hospital	Total distributed	Total responses	Response rate
Al Sabah	280	176	63%
Al Farawania	230	128	56%
Al Amiri	220	121	55%
Mubarak	270	116	43%
Total	1000	541	54%

It is clear from Table 6.2 that Al Sabah hospital had the largest number of respondents (176 or 32.5 % of the total). The participants in Al Sabah hospital were more cooperative with the research study. The number of respondents in Mubarak hospital was 116 (21.4% of the total). Mubarak hospital is a teaching-based hospital and the staff are very busy and also were not as cooperative with the research study.

Table 6.2: Frequency distribution of responses from the four hospitals

Hospital	Frequency	Percent
Al Amiri	121	22.4%
Al Farawania	128	23.7%
Al Sabah	176	32.5%
Mubarak	116	21.4%
Total	541	100.0

6.2 Respondents' demographic details

The first section of the questionnaire asked for demographic data. The demographic data included respondents' gender, age, the organization where they normally worked, the department of their specialty, their work experience since they qualified and their work experience in Kuwait hospitals.

6.2.1 Gender

As is evident from Table 6.3, the majority of the respondents were male (416 or 77%) with under a quarter being female (125 or 23%). This is an expected result because the actual total number of male doctors in the four hospitals is higher than the number of females, as shown in chapter four (see page 140) .

Table 6.3: Gender frequency distributions

Gender	Frequency	Percent
Male	416	77%
Female	125	23%
Total	541	100.0%

6.2.2 Job Titles

Table 6.4 shows the respondents' job title. As is evident from the table, nearly half of the respondents (264 or 48.8%) had the job title of 'registrar'. Only 12 (2.2%) were senior specialists.

Table 6.4: Frequency distribution of job titles

Job Titles	Frequency	Percent
Consultant	29	5.4%
Senior Specialist	12	2.2%
Specialist	39	7.2%
Senior Registrar	62	11.5%
Registrar	264	48.8%
Assistant Registrar	97	17.9%
Trainee	38	7.0%
Total	541	100.0%

6.2.3 Age

Table 6.5 shows that nearly half of the respondents (267 or 49.4%) fell into the 31-40 age group; many respondents, as shown in the previous table, had the job title of registrar which normally falls within that age range. A very small number of respondents (7 or 1.3%) were in the age group over sixty years old.

Table 6.5: Age distribution of respondents

Age	Frequency	Percent
Under 30	111	20.5%
31-40	267	49.4%
41-50	123	22.7%
51-60	33	6.1%
Over 60	7	1.3%
Total	541	100.0%

6.2.4 Nationality

It can be seen in Table 6.6 that there is no big difference between the number of Kuwaiti and non-Kuwaiti respondents.

Table 6.6: Distribution of respondents by nationality

Nationalities	Frequency	Percent
Kuwaiti	252	46.6%
Non-Kuwaiti	289	53.4%
Total	541	100.0%

Figure 6.1 illustrates the frequency distribution of nationality within organizations. It is obvious that Al Amiri had the highest proportion of Kuwaiti respondents (67.8%). However, Al Sabah has the lowest proportion of Kuwaitis (35.8%). Regarding the number of non-Kuwaitis, Al Sabah had the highest proportion of non-Kuwaiti respondents (64.2%) with Al Amiri having the lowest. This confirms the rationale behind the choice of Al Amiri, to increase the chances of having more Kuwaitis among the respondents. That was confirmed in the results in the last section which indicated the similar number of Kuwaiti and non-Kuwaiti respondents.
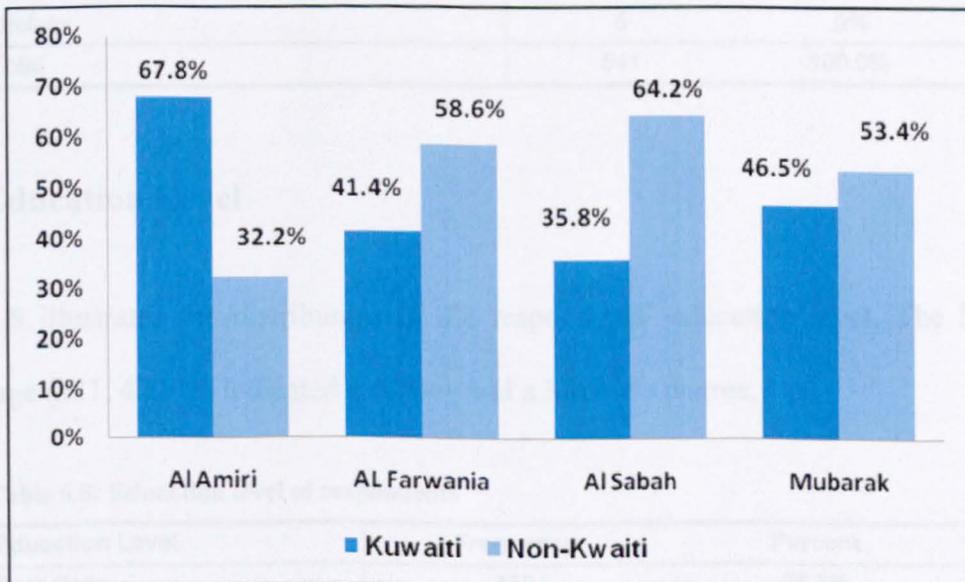
Figure 6.1: Distribution of respondents' nationality from the four hospitals

6.2.5 Department

Table 6.7 shows the frequency distribution of respondents among the different departments. As expected, many respondents (172 or 31.8%) worked in the Internal Medicine department. Because Internal Medicine usually involves several sub-specialities, this department has the largest number of doctors. Only 5 (.9%) respondents worked in the Urology department. In some hospitals, the Urology department is a sub-speciality in the surgical department.

Table 6.7: Frequency distribution of respondents by department

Department	Frequency	Percent
Internal Medicine	172	31.8%
Paediatrics	102	18.9%
General Surgery	78	14.4%
Emergency/Casualty Unit	73	13.5%
E.N.T	31	5.7%
Obstetrics & Gynaecology	21	3.9%
Dermatology	21	3.9%
ICU and Anaesthesia	19	3.5%
Orthopaedics	19	3.5%
Urology	5	.9%
Total	541	100.0%

6.2.6 Education Level

Table 6.8 illustrates the distribution of the respondents' education level. The largest percentage (231, 42.7%) indicated that they had a Master's degree.

Table 6.8: Education level of respondents

Education Level	Frequency	Percent
Bachelor's	153	28.3%
Master's	231	42.7%
PhD	99	18.3%
MRC	24	4.4%
FRC	34	6.3%
Total	541	100.0%

6.2.7 Working Experience

Table 6.9 shows the range of respondents' working experience since qualification. A quarter of the respondents were in two of the groups: 1-5 years and 6-10 years working experience.

Table 6.9: Years experience since qualifying

Experience years	Frequency	Percent
Less than one year	53	9.8%
1-5 Years	140	25.9%
6-10 Years	136	25.1%
11-15 Years	95	17.6%
16-20 Years	51	9.4%
More than 20	66	12.2%
Total	541	100.0%

Additionally, the respondents were asked about their working experience in Kuwait hospitals. Table 6.10 demonstrates that nearly half of the respondents had 1-5 years of experience of working in Kuwait hospitals.

Table 6.10: Years of work experience in Kuwait Hospitals

Experience years in Kuwait	Frequency	Percent
Less than one Year	92	17.0
1-5 Years	243	44.9
6-10 Years	92	17.0
11-15 Years	59	10.9
16-20 Years	24	4.4
More than 20	31	5.7
Total	541	100.0

6.3 Information needs

Respondents were asked about the information needs that apply to their medical practice. Table 6.11 illustrates that respondents need information for different reasons but the majority (497 or 91.9%) need information for keeping up-to-date, followed by continuing education (427 or 78.9%) and improving their clinical decision-making (403 or 74.5%). Two respondents mentioned other needs such as improving their skills in surgical practice. This means they need more training to improve their skills.

Table 6.11: Frequencies of reasons for information needs

Reasons	Responses	
	Number	*Percent*
Keeping up-to-date	497	91.9%
Continuing Education	427	78.9%
Improving your clinical decision making	403	74.5%
Sharing Knowledge with your colleagues	376	69.5%
Improving your Knowledge	371	68.6%
Answering patient questions	361	66.7%
Answering colleagues' questions	350	64.7%
Teaching staff/students/colleagues (e.g. case presentation)	336	62.1%
Writing reports/research paper (not for publication)	298	55.1%
Writing reports/research paper (for publication)	286	52.9%
Other (improving their surgical skills)	2	.4%

The chi-square test was performed to assess the significant relationship between doctors' information needs and their working experience since qualifying. To run the chi-square test effectively, some groups in the 'working experience since qualifying' variable were combined by using the 'recode into same variables' option in SPSS (see Table 6.12), thus the groups used were as follows:

- Less and equal to 5 years.
- Between 6 and 15 Years.

- More and equal to 16 Years.

Table 6.12: Recode the 'experience since qualifying' variable

Experience years	Frequency	Total
Less than one year	53	193
1-5 Years	140	
6-10 Years	136	231
11-15 Years	95	
16-20 Years	51	117
More than 20	66	
Total	541	100.0%

As evidence from Table 6.13 shows, there is no statistically significant relationship between most information needs reasons and doctors' working experience, except the reason of information needs for teaching staff/students/colleagues. The chi-square value is 7.771 with 2 df and a significance shown as .021. The significance meets the criterion of p<.05 the summary notation is:

$$X^2 (df) = value, \text{ p-value } (p<.05; \text{ or } p> .05), \text{ or } X^2 (2) = 7.771, p<.05.$$

Table 6.13: Chi-Square Test of information needs and working experiences

Reasons	Chi-Square-Tests		
	Value	*Df*	*Significant*
Improving your clinical decision-making	3.729	2	.155
Keeping up-to-date	.820	2	.664
Improving your knowledge	3.601	2	.165
Continuing Education	2.216	2	.330
Sharing knowledge with your colleagues	.988	2	.610
Answering colleagues' questions	3.657	2	.161
Answering patient questions	.183	2	.913
Writing reports/research paper (not for publication)	3.504	2	.173
Writing reports/research paper (for publication)	2.972	2	.226
Teaching staff/students/colleagues (e.g. case presentation)	7.771	2	.021

Figure 6.2 illustrates the association between the overall working experiences and the reason for seeking information for the teaching of staff or students or colleagues.
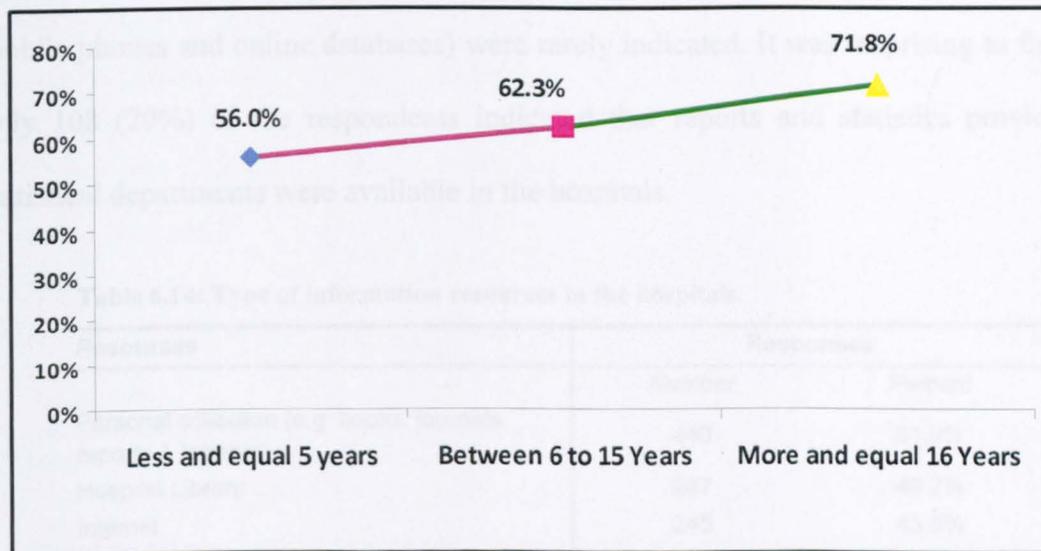
Figure 6.2: The association between working experience and teaching purpose

The results in Figure 6.2 indicate that respondents who have more working years experience are more likely to need information to teach staff, students and colleagues. This suggests that working experience is an important factor for teaching students or staff or colleagues. This is expected because it is usually the doctors with extensive working experience who are engaged to teach students or their less-experienced colleagues.

6.4 Information Seeking

6.4.1 Information resources in KGH

The focus group results showed that some respondents were unaware of some of the information sources that were available in their hospitals. Respondents were asked

about the type of information resources that existed in their hospital. As is evident from Table 6.14, personal collections (440 or 81.9%) were an important feature of the information sources available in the hospitals, while other information sources (e.g. mobile phones and online databases) were rarely indicated. It was surprising to find that only 108 (20%) of the respondents indicated that reports and statistics provided by statistical departments were available in the hospitals.

Table 6.14: Type of information resources in the hospitals.

Resources	Responses	
	Number	*Percent*
Personal collection (e.g. books, journals, reports & Internet)	440	81.9%
Hospital Library	267	49.7%
Internet	245	45.6%
Departmental collection (e.g. books, journals, tapes & drug literature)	233	43.4%
Office Telephone	230	42.8%
Annual reports/statistics (from statistical department)	108	20.1%
Online databases (e.g. Medline)	46	8.6%
Mobile provided (i.e. not personal)	11	2.0%
Other (Personal Laptop)	23	4.3%
Other (Asking colleagues)	12	2.2%

Table 6.15 shows the availability of resources in each hospital as indicated by the respondents. A large percentage of respondents in Al Amiri (90.1%) and Al Farwania (71.8%) hospitals reported that they had a hospital library, while low percentages of respondents in Al Sabah (31.25%) and Mubarak (9.4%) hospitals indicated that they had hospital libraries. That confirmed the focus group results of the Al Farwania participants who indicated that they have a library in their hospitals while Al Sabah and Mubarak focus group participants revealed that their hospitals had no library. The number of respondents who indicated that they had the Internet was similar in all hospitals. Also, the number of the other resources was quite similar between the four hospitals.

Table 6.15: Distribution of information resources in the four hospitals

Resources	Organization							
	Al Amiri		*Al Farawania*		*Al Sabah*		*Mubarak*	
	N	%	N	%	N	%	N	%
Personal collection (e.g. books, journals, reports & Internet)	106	87.6%	103	80.5%	137	77.8%	94	81.0%
Hospital Library	109	90.1%	92	71.8%	55	31.25%	11	9.4%
Internet	57	47.1%	52	40.6%	72	40.9%	64	55.2%
Departmental collection (e.g. books, journals, tapes & drug literature)	66	54.6%	46	35.9%	74	42.04%	47	40.5%
Office Telephone	65	53.7%	46	35.9%	83	47.16%	36	31.0%
Annual reports/ Statistics (from statistical department)	41	33.9%	19	14.8%	34	19.3%	14	12.1%
Online databases (e.g. Medline)	8	6.6%	9	7.0%	12	6.8%	17	14.7%
Mobile provided (i.e. not personal)	4	3.3%	1	0.8%	5	2.8%	1	0.9%

According to focus group participants, attending meetings, seminars and conferences was an important source of gathering information. As is evident from Table 6.16, ward rounds and weekly and monthly meetings were clearly the most frequently held type of meeting in the hospitals. That is not surprising because these meetings are required by the nature of the profession. It is interesting to find that more than half of the respondents mentioned that they attended journal clubs.

Table 6.16: Meetings attended

Type of meetings	Responses	
	Number	*Percent*
Ward round	447	82.6%
Daily meeting/seminars in your hospital	356	65.8%
Weekly/monthly meeting/seminars in your hospital	449	83.0%
Journal clubs	292	54.0%
Other meeting/seminars in other organisations	144	26.6%
Attending conferences	377	69.7%
Courses/workshops in other organisations (e.g. computer training)	154	28.5%
Other (CME seminars & courses)	7	1.3%

Figure 6.3 demonstrates the distribution of the respondents attending meetings for the four hospitals. As expected, Mubarak hospital has the highest percentage (81.0%) of respondents attending daily meetings and seminars in the hospital because Mubarak is a teaching hospital, thus, attending daily meetings and seminars will be normal for teaching purposes. It is evident from the results in the figure that Al Amiri has the highest percentage of respondents attending weekly/monthly seminars in the hospital and also attending journal clubs. However, Al Sabah respondents are more likely to attend meetings and seminars outside their organization and attend conferences and courses/workshops (e.g. computer training). Also, it is obvious that the numbers attending conferences are fairly similar in the four hospitals.
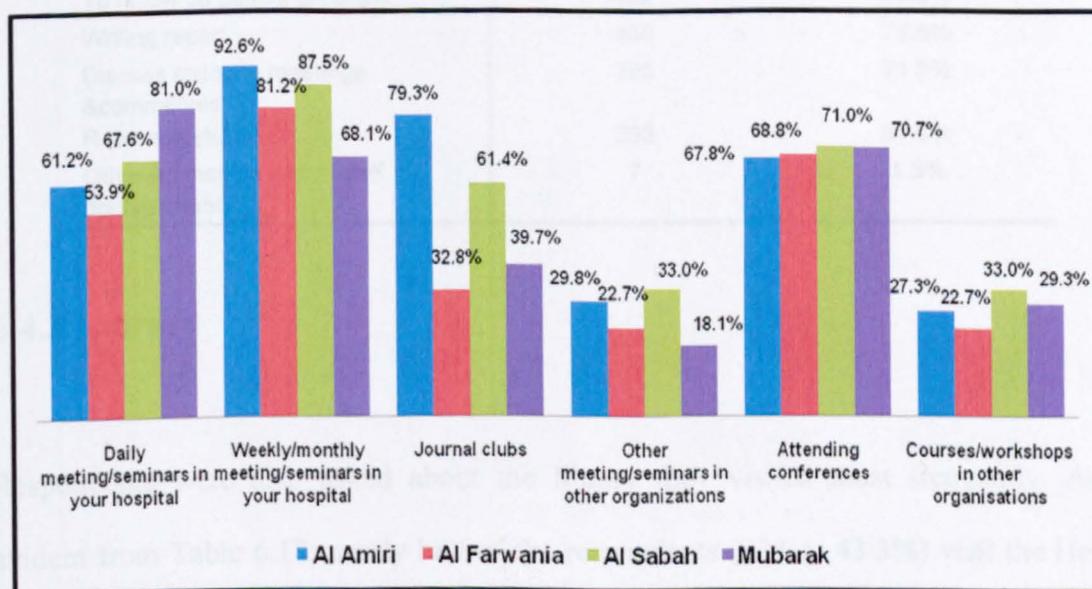
Figure 6.3: Frequency distribution of meetings among hospitals

6.4.2 Patients' medical files

The respondents were asked about their seeking behaviour in using common information resources for their medical practice such as patient medical files, a library, the Internet and communication with their colleagues. Respondents were asked about their reasons

for using patients' records. Table 6.17 demonstrates that different benefits of using patients' files were reported by respondents. It is clear from the table that the majority of respondents used the patients' files for reading a patient's history and for recording patient data. Seven of the respondents reported other reasons, such as the monitoring of junior staff documentation. These respondents were consultants, so they used the patient files as documents for monitoring their staff performance.

Table 6.17: Reasons for using patient file

Reasons	Responses	
	Number	*Percent*
To read patient history	502	93.0%
To record patient data (e.g. history, diagnosis & treatment)	489	90.6%
To follow up patient progress	482	89.3%
Writing report	408	75.6%
Discuss cases in meetings &committees	385	71.3%
Research study	203	37.6%
Other (to monitor junior staff documentation)	7	1.3%

6.4.3 Library

Respondents were also asked about the library they visited most frequently. As is evident from Table 6.18, nearly half of the respondents (234 or 43.3%) visit the Health Sciences Centre Library in the Faculty of Medicine at Kuwait University. Also, approximately the same number of respondents (224 or 41.4%) did not visit any library. A very small number of respondents (62 or 11.5%) reported that they used the hospital library. In addition, only 5 mentioned the Kuwait Institute for Medical Specialization (KIMS) library.

Table 6.18: Name of library visited by respondents

Library	Frequency	
	Number	*Percent*
Hospital library	62	11.5%
Faculty of Medicine library	234	43.3%
Hawally library	1	.2%
KIMS library	5	.9%
None	224	41.4%
Total	541	100.0%

The focus groups results indicated that the participants did not visit medical libraries very often. The respondents were also asked also about the frequency of their visits to the library. As is evident from Figure 6.4, the highest percentage of respondents reported rarely visiting the library. A few of the respondents reported visiting the library daily.
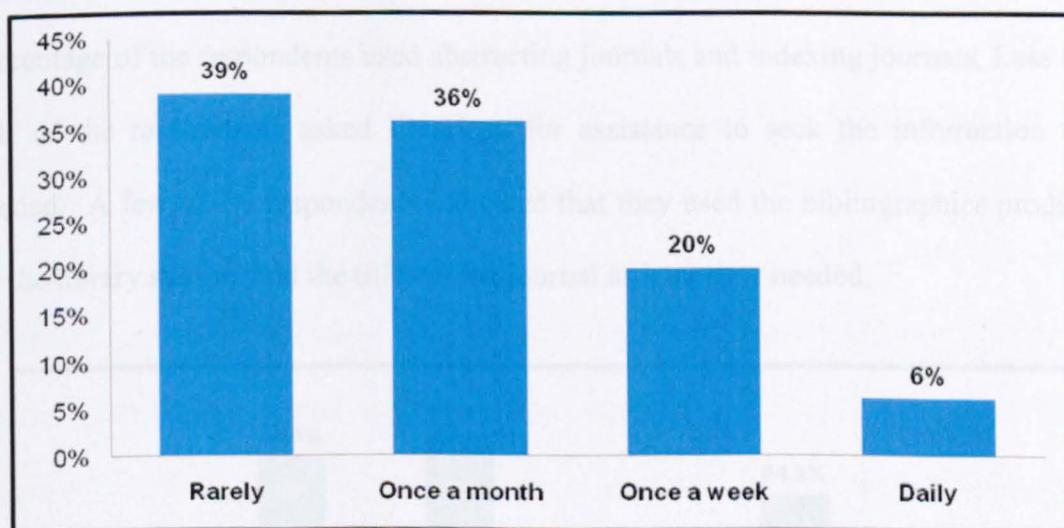
Figure 6.4: Frequency of visiting the library

Another question asked respondents about the type of information resources they seek in the library. Table 6.19 shows that the respondents seek a variety of resources in the library, but most of them (244 or 77.2%) seek serials e.g. journals, periodicals, magazines and newspapers. Less than 10% of the respondents use the library to seek out government publications and statistics and annual reports.

Table 6.19: Type of resources sought by respondents in the library

Resources	Responses	
	Number	Percent
Books	231	73.1%
Serials (e.g. journals, periodicals, magazines & newspapers)	244	77.2%
Internet	188	59.5%
Medical databases (e.g. Medline)	130	41.1%
Thesis/research paper/reports	50	15.8%
Government publications	24	7.6%
Statistics/Annual reports	24	7.6%
Video tapes/microfilms	33	10.4%
Conferences papers	47	14.9%

The participants also specified the tools that they used when they accessed the information they needed in the library. Figure 6.5 demonstrates that the highest percentage of the respondents used abstracting journals and indexing journals. Less than half of the respondents asked librarians for assistance to seek the information they needed. A few of the respondents indicated that they used the bibliographies produced by the library staff to find the titles of the journal articles they needed.
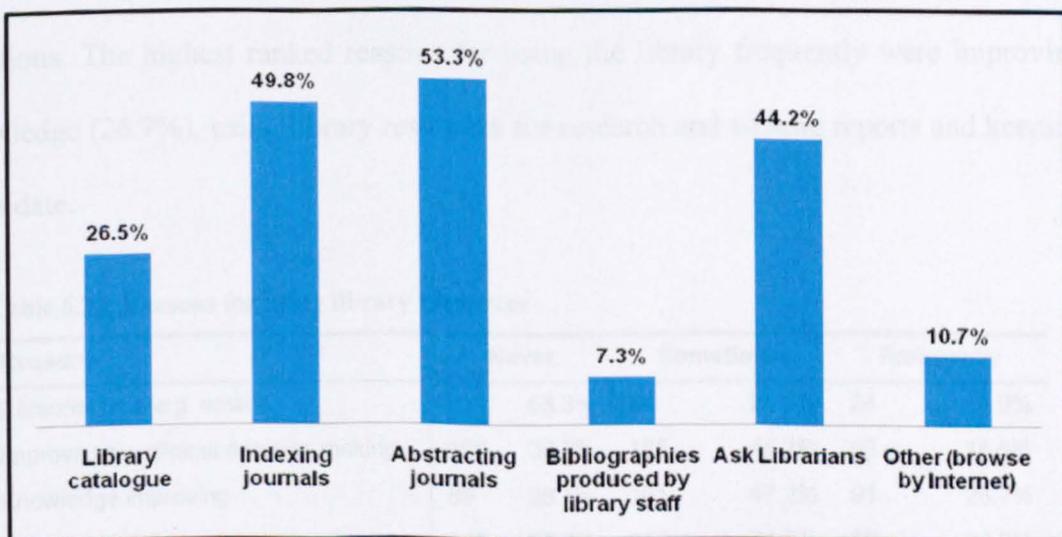
Figure 6.5: Tools for accessing information resources in the library

The respondents were asked about their reasons for using library resources. The reliability of the Likert scale used in this question was assessed also by using Cronbach's Coefficient Alpha. The results presented in Table 6.20 indicate that the Likert scale used was reliable.

Table 6.20: Library use Likert scale

Reliability Statistics	
Cronbach's Alpha	*N° of Items*
.877	9

It seems from Table 6.21 that the respondents used the library resources for a range of different reasons. The first response category on the questionnaire was personal use, such as using email. A high percentage of the respondents (68.3%) indicated that they never used library resources for this purpose. Going through the other reasons, it seems that a high percentage of respondents reported sometimes using the library resources for reasons such as answering colleagues' questions, continuing education and research and writing reports or articles and teaching staff or students. It is interesting to find that more than half of the respondents seek information from the library for answering patients' questions. The highest ranked reasons for using the library frequently were improving knowledge (26.7%), using library resources for research and writing reports and keeping up to date.

Table 6.21: Reasons for using library resources

Reasons	Never		Sometimes		Frequently	
Personal use (e.g. email)	233	68.3%	84	24.6%	24	7.0%
Improve your clinical decision making	103	30.2%	185	45.2%	53	15.5%
Knowledge improving	89	26.1%	161	47.2%	91	26.7%
Keep up-to-date	112	32.8%	150	44.2%	79	23.2%
Continuing education	79	23.2%	188	55.1%	74	21.7%
Answer colleagues' questions	100	29.3%	199	58.3%	42	12.3%
Answer patients' questions	130	38.1%	174	51.0%	37	10.8%

Reasons	Never		Sometimes		Frequently	
Research/reports/articles	71	20.8%	189	55.4%	81	23.7%
Teaching staff/students	91	16.8%	189	34.9%	61	11.3%

6.4.4 Internet

All participants in the three focus groups indicated that they frequently use the Internet and that the Internet was an essential information source that aided their medical practice. This sub-section focused on the number of doctors who used the Internet, the places where they used the Internet and their reasons for using the Internet. The results in Figure 6.6 indicate that almost all respondents (534 or 99%) used the Internet.
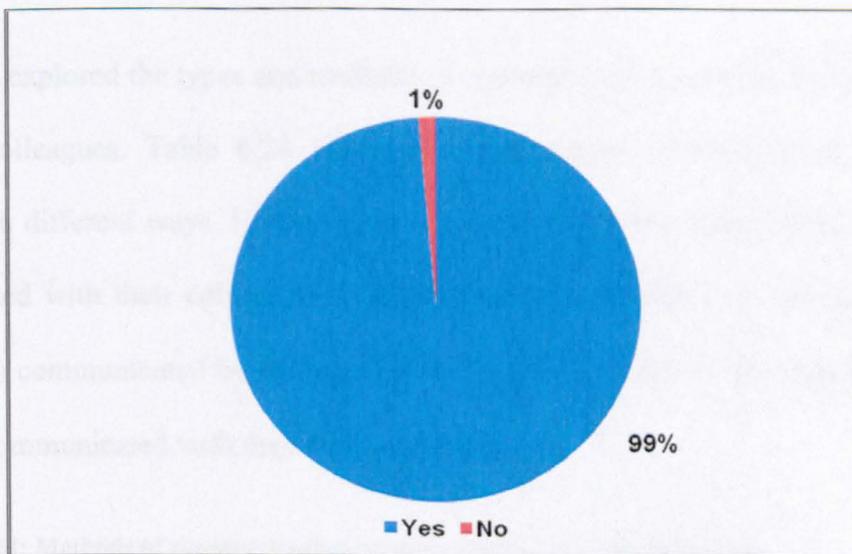
Figure 6.6: The use of the Internet

Figure 6.7 demonstrates that most of the respondents (97.0%) used the Internet at home. Only 36.5% used the Internet in the hospital. A small number of respondents used the Internet in libraries, such as hospital libraries.

Table 6.23: Reasons for using the Internet

Reasons	Never		Sometimes		Frequently	
Personal use (e.g. email)	11	2.0%	90	16.8%	434	81.1%
Improve your clinical decision making	8	1.5%	167	31.2%	360	67.3%
Knowledge improving	5	.9%	124	23.2%	406	75.8%
Keep up-to-date	5	.9%	108	20.1%	422	78.8%
Continuing education	13	2.4%	141	26.3%	381	71.2%
Answer colleagues' questions	22	4.1%	218	40.7%	295	55.1%
Answer patients' questions	50	9.3%	209	39.0%	276	51.5%
Research/reports/articles	11	2.0%	160	29.9%	364	68.0%
Teaching staff/students	55	10.2%	185	34.5%	295	55.1%

6.4.5 Communication with colleagues

This section explored the types and methods of communication between the respondents and their colleagues. Table 6.24 shows that respondents communicated with their colleagues in different ways. However, the majority of the respondents (532 or 98.3%) communicated with their colleagues in the hospital face-to-face (e.g. meetings). Also, 446 (82.4%) communicated by mobile phone. Surprisingly, few of the respondents (62 or 11.5%) communicated with their colleagues by email.

Table 6.24: Methods of communication between respondents and colleagues

Method of communication	Responses	
	Number	*Percent*
Face-to-face	532	98.3%
By mobile/cell phone	446	82.4%
By meeting	427	78.9%
By office telephone	378	69.9%
By sending letter	98	18.1%
By email	62	11.5%

Respondents indicated different reasons for communicating with their colleagues. The results in Table 6.25 shows that most of the respondents 469 (86.7%) communicated with their colleagues to discuss patients cases and to ask for second opinions (457 or 84.5%).

Table 6.25: Reasons for communication with colleagues

Reasons for communication	Responses	
	Number	*Percent*
Discuss other patient cases	469	86.7%
To ask for second opinion	457	84.5%
Sharing Knowledge	422	78.0%
To give second opinion	316	58.4%
Other (discuss administrative problems)	12	2.2%
Other (discuss social issues)	3	.6%

The chi-square test was used to investigate whether respondents' working experience was associated with their reason for communicating with colleagues. Table 6.26 shows the Pearson chi-square result and indicates that there is a statistically significant relationship between respondents' working experiences and reason for communication with their colleagues. The significance meets the criterion of $p<.05$.

Table 6.26: Chi-square test results of doctors' experiences and asking colleagues

Reasons	Chi-Square-Tests		
	Value	*Df*	*Significant*
Discuss cases	25.454	3	.000
To ask for second opinion	23.575	3	.000
Sharing Knowledge	14.047	3	.003
Consult for admitting or discharging patients	14.030	3	.003
To give second opinion	31.160	3	.000

Figure 6.8 shows the association between the two variables. It is evident from the figure that respondents who are less experienced are more likely to discuss cases; to ask for a

second opinion; to share knowledge and consult for admitting or discharging patients. However, more experienced respondents are more likely to give second opinions.
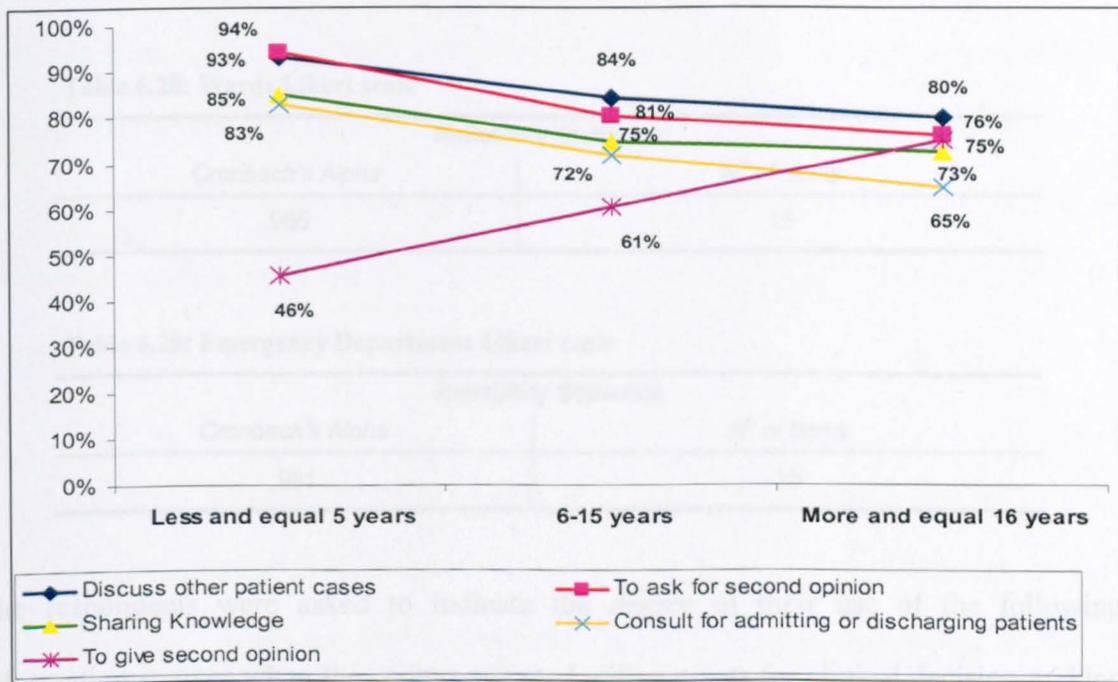
Figure 6.8: Association relationship between the two variables

6.4.6 Information-seeking in clinical areas

This section demonstrates the respondents' information-seeking in different clinical scenarios. It shows the degree of use of the resources that exist in doctors' hospitals when they communicate with patients for clinical decision-making in three scenarios: outpatient departments, wards and the emergency department. The reliability of the Likert scale that was implemented in this question was assessed by using Cronbach's Coefficient Alpha. The results outlined in Tables 6.27, 6.28 and 6.29 confirm that the Likert scale used was reliable. The result of the three scale scenarios was > 0.7.

Table 6.27: Outpatient Likert scale

Reliability Statistics	
Cronbach's Alpha	N° of Items
.974	15

Table 6.28: Wards Likert scale

Reliability Statistics	
Cronbach's Alpha	N° of Items
.965	15

Table 6.29: Emergency Department Likert scale

Reliability Statistics	
Cronbach's Alpha	N° of Items
.981	15

The respondents were asked to indicate the degree of their use of the following information sources when they communicated with patients for clinical decision-making in the three different scenarios:

- Interpersonal communication (patients, patients' parents/relatives/maids, colleagues, nurses, pharmacist and ambulance staff).
- Patient medical files.
- Order tests/investigations.
- Departmental collection.
- Personal collection.
- Drug literature.
- Healthcare Information System.
- Internet.
- Library resources.
- Call other hospitals.

For the purpose of data analysis, the different types of information sources were grouped into two main categories: patient data and knowledge-support resources. The patient data

category consists of all types of information that contribute to patient data history as well as investigation results including: asking the patient, asking patients' parents or relatives or friends or maids, ordering lab tests, and radiology investigations, patient data extracted from ambulance staff and nurses, patient medical files and the Healthcare Information System. The second category includes all knowledge support resources such as library resources, the Internet, personal collections, departmental collections, asking colleagues, asking pharmacists, drug literature and calling other hospitals for consultation in a specialty which does not exist in the hospital.

The focus group participants indicated that when they communicated with patients the primary source of obtaining information to help them in their clinical decision-making was their own knowledge and experiences. In addition, this knowledge could be enhanced with key information such as patient data. As evidenced in Table 6.29 ('not applicable' results are excluded from this table), in outpatients and on the wards, the sources used most frequently by doctors to obtain patient data were asking the patient, the patients' medical files and requesting tests and investigations. The results are similar in the emergency department, however, asking a patient's parents or relatives or maid (220 or 70.3%) is more frequently used as a patient data resource than the patient files (140 or 45.0%).

Table 6.29: Use of patient data

Source	Outpatient			Wards			Emergency		
	F N %	S N %	N N %	F N %	S N %	N N %	F N %	S N %	N N %
Ask Patient	336 84.4%	52 13.1%	10 2.5%	368 81.7%	71 15.7%	11 2.4%	233 74.9%	76 24.4%	2 0.6%
Ask patients' parents/friends	212 53.2%	177 44.5%	9 2.3%	286 63.5%	159 35.3%	5 1.1%	220 70.3%	88 28.1%	5 1.6%
Ask nurses	68 17.1%	266 66.8%	64 16.1%	150 33.3%	265 58.8%	35 7.7%	68 21.8%	176 56.6%	67 21.5%
Ask ambulance	10 2.5%	54 13.7%	334 83.9%	12 2.6%	93 20.6%	345 76.6%	48 15.9%	174 57.6%	80 26.5%
Medical file	331 83.2%	59 14.8%	8 2.0%	374 83.1%	64 14.2%	12 2.6%	140 45.0%	141 45.3%	30 9.6%
Test/investigations	303 76.1%	87 21.8%	8 2.0%	368 81.9%	75 16.7%	6 1.3%	220 70.7%	84 27.0%	7 2.2%
HCIS	36 11.7%	112 36.5%	159 51.8%	67 18.6%	150 41.8%	142 39.5%	34 12.5%	81 29.7%	158 57.8%

A critical issue that emerged from the findings, however, was that not all 541 of the respondents used patients' files in the three clinical situations. 331 of the respondents frequently used patient files in the outpatients, 374 of respondents used them in the wards and only 140 used them in the emergency rooms. A majority of the respondents reported never gathering information from ambulance staff in outpatients (334 or 83.9%) or on the wards (345 or 76.6%) but many respondents (174 or 57.6%) reported they did sometimes gather information from ambulance staff in the emergency room. That is simply because the ambulance staff are available and provide services to the emergency room. In addition, it is clear from Table 6.29 that the Healthcare Information System was not indicated as a source used by many respondents. For example, 112 (36.5%) of the respondents indicated that they sometimes used it in outpatients. Also, 150 (41.8%) of the respondents said that they did so sometimes in the wards and 81 (29.7%) used it sometimes in the emergency room.

The focus group participants indicated that they seek information from knowledge-support resources to enhance their clinical decision-making. They indicated also that this usually occurred during breaks at work, after work and sometimes in overtime. Table 6.30 shows that using personal collections and asking colleagues are the sources used most frequently in the three clinical areas. In addition, asking pharmacists and drug literature are sources sometimes used in the outpatient and ward areas.

Table 6.30: Use of knowledge-support resources

Source	Area								
	Outpatient			Wards			Emergency		
	F	S	N	F	S	N	F	S	N
	N %	N %	N %	N %	N %	N %	N %	N %	N %
Ask colleagues	114 28.6%	246 61.8%	38 9.5%	171 38%	272 60.4%	7 1.5%	106 34.1%	179 57.5%	26 8.4%
Ask pharmacist	14 3.5%	281 70.6%	103 25.8%	21 4.6%	288 64%	141 31.3%	14 4.5%	152 48.8%	145 46.6%
Dep. Collection	49 13.3%	221 59.9%	99 26.8%	73 17.5%	241 57.6%	104 24.8%	27 9.3%	132 45.7%	130 44.9%
Drug literature	47 11.9%	289 73.2%	59 14.9%	70 15.6%	319 71.2%	59 13.2%	36 11.6%	166 53.7%	107 34.6%
Internet	66 19.5%	123 36.3%	150 44.2%	85 22.3%	177 46.5%	119 31.2%	32 12.2%	77 29.4%	153 58.4%
Personal collection	158 40.2%	209 53.2%	26 6.6%	228 51.5%	198 44.7%	17 3.8%	102 33.4%	122 40%	81 26.5%
Library resources	20 5.0%	107 27.1%	267 67.7%	34 7.6%	127 28.5%	285 63.9%	15 4.9%	74 24.0%	219 71.1%
Call other hospital	10 2.5%	198 49.7%	190 47.7%	19 4.2%	261 58%	170 37.7%	12 3.8%	156 50.2%	143 46.0%

In the emergency department, a high percentage of doctors reported sometimes using drug literature (166 or 53.7%) and asking colleagues (179 or 57.5%). The use of the Internet was not very high in any of the clinical areas. Use was highest on the wards where around half of the respondents (46.5%) indicated that they used it sometimes. Less than half of the respondents used it in outpatients and the emergency department.

The results in Table 6.30 show also that most of the respondents never used library resources in any of the three situations. Very few indicated that they frequently used library resources in the three situations, the highest use being on the wards. Also, the results from Table 6.30 illustrate that around half of the respondents and more were most likely to call other hospitals when they were working in the three clinical areas.

Figure 6.9 shows an overview of the degree of use of information sources by doctors in the three scenarios: outpatients, wards and emergency department. The results presented here are limited to specific information sources of patient data and knowledge resources that were indicated most frequently in the literature review and also sources that existed and were used in the three areas in the four hospitals studied. The patient data includes: ask patient, ask patients' parents/relatives/friends, ask nurses, patient files and order tests and investigations. The knowledge resources include: ask colleagues, ask a pharmacist, drug literature, the Internet, personal collection and library resources. SPSS was used for running the 'count value within cases' option to count all cases that either frequently or sometimes used all the selected sources of information in each situation.
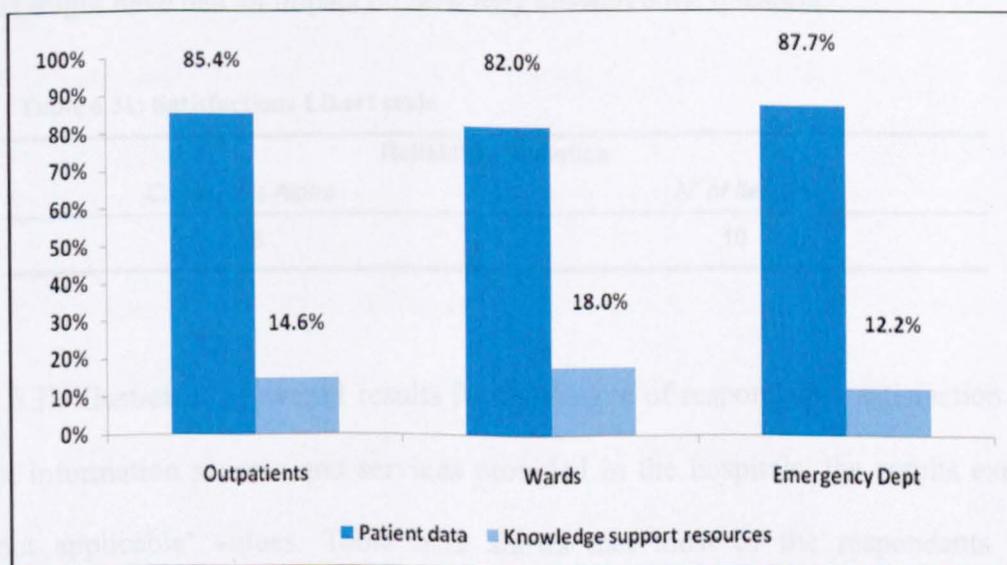
Figure 6.9: Overview use of resources

It is obvious from Figure 6.9 that there was a heavy reliance on using patient data in the three clinical scenarios. In contrast, knowledge resources were less extensively used, particularly in outpatients and the emergency department. Knowledge resources were used most intensively on the wards (18.0%).

6.5 Satisfaction with information resources and services

The focus group participants indicated that they were dissatisfied with many of the information resources in their hospitals e.g. the hospital library, the Internet and patient files. This section investigated the degree of participants' satisfaction in using the current information resources and services in Kuwait hospitals. Because a Likert scale was applied in this question, thus, Cronbach's Coefficient Alpha was used to measure the reliability of the scale. The results demonstrated in Table 6.31 show that Cronbach's Alpha is less than 0.7 but very close to the 0.7 value. The result should be more than or equal to 0.7 to achieve reliability. This might be because of the nature of the question; respondents may have been dissatisfied or satisfied with one service more than on other and this might have had an impact on how they answered the question.

Table 6.31: Satisfactions Likert scale

Reliability Statistics	
Cronbach's Alpha	N^o of Items
.668	10

Table 6.32 illustrates the overall results for the degree of respondents' satisfaction with current information sources and services provided in the hospitals, the results exclude the 'not applicable' values. Table 6.32 shows that most of the respondents were dissatisfied with the services provided by the hospital library (69.7%) and Health Care

Information System (60.3%). Also, nearly half of the respondents were dissatisfied with the services provided by the medical record department and the accessibility of the Internet. In addition, many of the respondents (63.7%) felt neutral about communication with the patient. Around half of the respondents indicated they were satisfied with communication with their colleagues (52.7%) and attending daily/weekly/monthly meetings and seminars (48.5%).

Table 6.32: Degree of respondents' satisfaction with the current information sources

Information resources and services	Dissatisfied		Neutral		Satisfied	
	N	%	N	%	N	%
Hospital library services	242	69.7%	99	28.5%	6	1.7%
Medical record department services	236	44.7%	267	50.6%	24	4.5%
Communication with other departments (e.g. Labs, nursing, X-ray) in your hospital	139	25.8%	296	55.0%	103	19.1%
Accessibility of the Internet	207	47.1%	141	32.1%	91	20.7%
Communication with your colleagues	22	4.0%	233	43.2%	284	52.7%
Communication with your patients	45	8.3%	343	63.7%	150	27.8%
Communication with other hospitals and health centres	196	37.2%	283	53.7%	48	9.1%
Daily/weekly/monthly meetings and seminars	42	7.7%	236	43.7%	262	48.5%
Health Care Information System	277	60.3%	150	32.7%	32	6.9%
Attending conferences	87	16.4%	294	55.7%	147	27.8%

Table 6.33 shows the results of the participants who were dissatisfied, categorized by hospital ('Not applicable' value excluded from this table). It is evident from the table that most of the Al Farwania respondents were dissatisfied with the information services provided by their hospital library and medical record department. Most of the respondents were dissatisfied with the accessibility of the Internet from Al Amiri and Al

Farwania hospitals. The three hospitals: Al Amiri, Mubarak and Al Farwania have nearly the same percentage of respondents who were dissatisfied with HCIS. Al Sabah respondents were more likely to be dissatisfied with the Health Care Information System although the system has not yet been introduced to their hospital! Perhaps they were expressing their dissatisfaction regarding the slow introduction of the system.

Table 6.33: Dissatisfaction degree among the four hospitals

Information sources/services	Hospital							
	Al Amiri		Al Farwania		Al Sabah		Mubarak	
	N	%	N	%	N	%	N	%
Services provided by hospital library	75	66.4%	98 83.1%		54	59.4%	15	60%
Services provided by medical record department	40	33.3%	75 61.5%		62	37.0%	59	51.2%
Communication with other departments	21	17.3%	31 24.8%		34	19.3%	53	46.5%
Accessibility of the Internet	66	61.1%	62 63.3%		49	37.1%	30	30.0%
Communication with your colleagues	3	2.5%	7 5.55%		11	6.3%	1	0.86%
Communication with your patients	6	4.95%	10 7.87%		23	13.14%	6	5.21%
Communication with other hospitals/health centres	28	23.3%	55 45.5%		62	36.3%	51	45.1%
Daily/weekly/monthly meetings or seminars	8	6.61%	15 11.8%		10	5.7%	9	7.75%
Health Care Information System	72	68.6%	74 62.2%		66	51.2%	65	61.3%
Attending conferences	26	22.2%	24 19.5%		18	10.4%	19	16.5%

6.6 Problems in obtaining information

The participants of the focus groups indicated that language barriers, lack of information technology and time constraints were the major problems in obtaining the information they needed. Respondents were asked if they encountered any problems in obtaining the information they needed. It is clear from Table 6.34, that respondents revealed various

problems in obtaining important information for medical practice. For example, a high number of respondents (316 or 58.5%) indicated a lack of information technology such as mobiles and email for communicating with colleagues. Also, 50.6% reported language barriers with patients. Surprisingly, 53% of the respondents reported that a lack of patient awareness in understanding medical terms was a problem.

Table 6.34: Problems in obtaining information

Type of problems	Responses	
	Number	*Percent*
Lack of information technology such as mobile, email, to communicate with your colleagues	316	58.5%
High cost of subscriptions to electronic journals	236	43.7%
Lack of searching skills	106	19.6%
No facility to communicate with other hospitals	285	52.8%
Inadequate resources in hospital library	297	55.0%
Library is available in your hospital but located very far from your department	79	14.6%
Lack of patient awareness in understanding medical terms	286	53.0%
Language problem in communicating with patients/patients' parents/relatives/maids	273	50.6%
Patient missing appointments	218	40.4%
Gathering patients' information from patients' parents/relatives/maids	218	40.4%
Lack of time to talk with patients	193	35.7%
Unorganized forms in the patient files	195	36.1%
Missing forms & incomplete information in the patient files	181	33.5%
Inaccessibility of the patient files	133	24.6%
Lack of help from Medical Record staff	127	23.5%
Other (No Internet to access)	209	38.6%
Other (Patient has more than one file)	2	.4%
Other (Internet is available only for heads of departments & consultants)	4	.7%
Other (Old collection of resources in the hospital library)	5	.9%
Other (Delay in sending results of lab tests & other investigations)	7	1.3%

6.7 Improving health information sources and services

The participants were asked about their ideas and suggestions to improve the current health information resources and services in Kuwait government hospitals.The respondents reported several suggestions but it is interesting to note in Table 6.35 that a high number of respondents (89.8%) recommended health education for patients. Also, 84.6% of the respondents suggested improved communication with other international hospitals and healthcare centres.

Table 6.35: Suggestions for improving resources & services

Suggestions	Responses	
	Number	*Percent*
Health education for patients	485	89.8%
Improve communication with other international hospitals and healthcare centres	457	84.6%
Improve communication with other hospitals and health centres	443	82.0%
Digitize all information services such as MR and library	398	73.7%
Provide hospital library	321	59.4%
Provide better qualified staff in the Medical Record (MR) Department	306	56.7%
Train doctors on the use of the Internet and Information Technology	299	55.4%
Provide better qualified staff in the hospital library	231	42.8%
Other (up-to-date information resources in the hospital library)	14	2.6%
Other (improve communication with other departments by organizing lectures, seminars & meetings)	8	1.5%

6.8 Summary

The findings of the questionnaire provided a range of different opinions and facts but there were some issues that were reported frequently by respondents. Nearly all of the respondents need information for keeping up-to-date. Personal collections were the most

useful source of information reported by most of the respondents. Also, it was interesting to find more than half of the respondents attended journal clubs for gathering information. Nearly all of the respondents used the Internet and the majority of respondents used the Internet at home. The Internet was a significant source of information for several reasons, the most interesting of which was answering patients' questions.

Moreover, the results of the initial study showed that respondents used a variety of information sources when they practise in the three situations: outpatients, wards and emergency rooms. Interpersonal communication was the most frequent source of information used in the three situations; followed by using patients' medical files. The Internet was mostly used in the ward area while the library resources were rarely used in any of the medical areas. The questionnaire results showed a high number of the respondents were dissatisfied with services provided by the hospital library, the accessibility of the Internet, and the Health Care Information System. A lack of information technology to communicate with colleagues was the problem indicated by most of the respondents. Finally, the results showed an unexpected issue that most of the respondents suggested health education for patients as a means of improving the information provision in Kuwait hospitals.

Generally, the results of the questionnaire validated most of issues that were explored in the previous focus group stage. Also, the statistics and figures resulting from the questionnaire help in understanding the opinions and views from the large number of respondents. However, the researcher was motivated to explore some detailed issues that were not explored in the questionnaire and to investigate in more depth some of the issues covered. Thus, the research will progress by using interviews to discuss some of

the more interesting issues in more depth and to give a clearer picture of the research

problems.

Chapter Seven

Result Stage Three: Interviews

7.0 Introduction

The previous chapter showed the quantitative results obtained from the questionnaires. This chapter presents the outcome from the third data-collection instrument, namely the interviews. It provides more details about some of the issues that emerged from the focus groups and the questionnaire as well as some areas that had not previously been covered. A thematic approach was again used to analyse the qualitative data from this stage. As in the two previous chapters, the framework of themes and sub-themes followed is that developed according to the research questions, aims and objectives.

This chapter begins by presenting the information profile of the participants followed by their information needs. This is followed by the section on information-seeking which

covers the more detailed issues relating to the seeking for information sources by participants, such as some characteristics of the sources and the time and place where they are used. In addition the obstacles and problems encountered when seeking for information sources are explored. The last section shows the participants' opinions and suggestions for improving the current information provision services in KGH.

7.1 Participants' demographics and general information

Twenty doctors were interviewed using a semi-structured telephone interview. There were five selected interviewees from each study hospital: Al Amiri, Mubarak, Al Farwania and Al Sabah. Table 7.1 in page 246 gives details of the demographic profiles of the interview participants.

Table 7.1: Demographic profile of each interviewee

User ID	Organization	Department	Gender*	Age	Nationality.*	Education	Job title	Working experience
1	Mubarak	Paediatric	F	31-40	K*	Canadian board	Consultant	11-15Years
2	Mubarak	IM	M	31-40	K	Kuwaiti Board	Senior Registrar (SR)	6-10 Years
3	Mubarak	IM	F	31-40	NK*	MRCP	Registrar	1-5 Years
4	Mubarak	IM	M	31-40	K	MRCP	Registrar	1-5 Years
5	Mubarak	Paediatric	M	≤ 30	K	Bachelor's	Assistant Registrar (AR)	1-5 Years
6	Al Amiri	IM	M	≤ 30	K	Bachelor's	AR	1-5 Years
7	Al Amiri	Anaesthesia	F	31-40	NK	PhD	SR	11-15 Years
8	Al Amiri	IM	M	41-50	NK	Master's	Registrar	16-20 years
9	Al Amiri	Emergency	M	≤ 30	K	Bachelor's	AR	1-5 Years
10	Al Amiri	GS	M	≤ 30	K	Bachelor's	Trainee	< 1 Year
11	Al Sabah	E.N.T	M	41-50	NK	Master's	SR	11-15 Years
12	Al Sabah	Dermatology	F	31-40	K	PhD	Registrar	6-10 Years
13	Al Sabah	Emergency	M	41-50	NK	PhD	Registrar	11-15 Years
14	Al Sabah	Dermatology	M	31-40	NK	PhD	Registrar	1-5 Years
15	Al Sabah	IM	M	≤ 30	K	Bachelor's	AR	1-5 Years
16	Al Farwania	GS	M	41-50	K	FRCS	Senior Specialist (SS)	> 20 Years
17	Al Farwania	IM	M	31-40	K	FRCP	Specialist	1-5 Years
18	Al Farwania	Obs. & Gyn.	F	41-50	NK	MRCOG	Registrar	1-5 Years
19	Al Farwania	GS	M	31-40	K	Master's	Registrar	1-5 Years
20	Al Farwania	IM	M	31-40	NK	Master's	AR	1-5 Years

7.2 Theme one: Information needs

The questionnaire results in the previous chapter showed that the majority of the respondents (497 or 91.9%) need information for keeping up-to-date. Thus, interviewees were asked how important keeping up-to-date was for them in their medical practice. They indicated several advantages. Some of them mentioned that the nature of their profession required them to be up-to-date with new information. One interviewee in Al Amiri hospital said:

"Medicine is a science and since it's a science it is continually updating and changing, so we have to keep track of those changes".

Also, some interviewees indicated another benefit; that keeping up-to-date will improve patient care, management and treatment plans. In addition, another advantage of keeping up-to-date was to improve the doctors' decision-making such as for diagnosis, treatment and handling unknown cases.

Moreover, most interviewees revealed that keeping up-to-date would help with the continuity of good practice and improve their knowledge.

"Medical knowledge is not static, it is rapidly changing, such new information should be delivered to doctors to ensure the continuity of good practice" (Interviewee, Al Farwania hospital).

The interviewees were also asked if they had any other needs for information which applied to their medical practice. The majority of them provided the same reasons for needing information as those listed on the questionnaire. However, two interviewees

added that they needed information to improve their professional skills and gain experience.

> *"Of course I have other professional needs. Being an ENT surgeon I want to attend more and more workshops and conferences to get hands-on experience of newer procedures and share our experiences"* (Interviewee, Al Sabah hospital).

7.3 Theme two: Information-seeking

Participants in the focus groups and the respondents to the questionnaire indicated several types of information sources they sought for their medical practice. Some aspects relating to the use of the sources were explored in more detail in the interviews.

7.3.1 Hospital and Medical Libraries

The focus group participants indicated that the Health Sciences Centre Library was the library they visited most frequently to seek for the information they needed. The questionnaire results were consistent with those of the focus groups and indicated that of all the libraries listed, the Health Sciences Centre Library was the one which the highest proportion of respondents visited, but even then, only rarely. The interviewees gave details of the reasons for that. Most interviewees agreed that time and distance are barriers preventing them from visiting the library.

> *"Because it is not available near my place of work"* (Interviewee, Al Sabah hospital).

In addition, most interviewees preferred to use the Internet rather than the library because it was considered an accessible, up-to-date and fast information source. Some

of the hospitals had a library but it had a small and old collection. On the other hand, two interviewees from Al Sabah hospital working in the Dermatology department were satisfied with their library. They said:

"We have a library in our centre which holds all different sources like books, journals, etc ... And we have a computer room with 3 PCs connected to the Internet (besides the PC's we have in most clinics) and some electronic sources are located on these PCs".

Most interviewees specified the type of resources they frequently sought in the HSCL. Most of them indicated serials such as journals in two versions (electronic and paper). Some of them said books.

7.3.2 ICT resources

Interviewees were also asked about some detailed issues involving the use of ICT resources such as the Internet, HCIS and mobile phones.

7.3.2.1 The Internet

A large number of respondents to the questionnaire used the Internet. Some specific issues related to the use of the Internet were clarified by the interviews. First, the interviewees were asked about the frequency of their Internet use. Nearly all of them said they used it daily. One interviewee from Al Farwania reported:

"I use the Internet 4-6 hours daily".

A few of the interviewees used the Internet two or three times a week or when they needed to. Furthermore, the interviewees listed some medical websites they frequently accessed such as PubMed, Ovid, Medline, NEJM, FDA, Emedicine and Medscape. Also, some mentioned the Google search engine. An interviewee from Al Amiri provided the following websites:

- www.rxlist.com
- www.emedicine.com
- www.vh.org
- www.cochrane.com
- www.kuwaitpharmacy.com

The interviewees were probed on the criteria they considered when choosing health information on the Internet. They mentioned different things such as clarity, accessibility, how up-to-date it was, originality, whether it was peer-reviewed and whether it was evidence-based.

"The website should provide a literature review and current studies and trials"
(Interviewee, Mubarak hospital).

Some of them mentioned looking at websites recommended by their colleagues.

Also, some interviewees were asked about the reason for searching for information from the Internet to answer patient questions. The interviewees indicated that sometimes they met patients who brought printouts from the Internet so that they could discuss their cases and treatment. Some patients wanted to share opinions with doctors to look for more progress for their treatment, for example, in an international hospital.

7.3.2.2 Healthcare Information System

The use of the Healthcare Information System was investigated in the interviews. The interviewees were asked about their experiences in using the system, such as the type of data they entered and the strengths and weaknesses of the system. Only the interviewees at Al Sabah hospital were excluded from this part of the interview, because the system is not yet operating in their hospital. Regarding the interviewees' experiences in interacting with the system in Mubarak hospital, interviewees mentioned that the system had only recently started in their hospital and they had used it only for entering data, such as patient diagnosis, progress and medication and writing the discharge summary. For example, one interviewee said:

"It is being introduced slowly now. We use it for admitting patients, requesting medication and writing discharge summary for the time being".

In Al Amiri hospital, the interviewees stated that the system worked in their hospital, but not in all hospital departments. They used it to insert patient data and some investigations such as laboratory results. However, in Al Farwania hospital, the interviewees showed some progress in using their system. They mentioned that they input data such as patient data, lab tests and X-ray results. One interviewee reported:

"It is an easy, effective system which saves time and effort.

We are using it to enter general health data for the patient, diagnosis, blood laboratory requests, to order X-ray imaging and see the film and read the report and to prescribe medications".

7.3.2.3 Mobile or cell phones

The questionnaire results showed that almost all of the respondents did not have mobile phones provided by their hospitals. In addition, most respondents indicated that they used their personal mobiles to communicate with their colleagues. The interviewees were asked about the value of using mobiles for their medical practice.

In Mubarak, Al Farwania and Al Sabah hospitals, interviewees confirmed the lack of availability of mobiles provided by the hospitals, and that they always used their personal mobile. Most of them revealed the importance of using mobiles to communicate with their colleagues on a daily basis for sharing consultations that would enhance patient care.

"The most important thing is to be in touch with our colleagues, both in our specialty and in other specialties as well. There are times when you need a second opinion or you need people from other specialties to give their opinion.
All this can change the outcome of the patient's care" (Interviewee, Al Farwania hospital).

However, the Al Amiri interviewees had different opinions. They mentioned that they had internal mobiles and a paging system provided by the hospital. This was an easy and accessible system. They could communicate with their colleagues at any time and in any place in the hospital, particularly in the basement level which had no personal mobile coverage. An interviewee from Al Amiri said:

"I carry an internal mobile and paging system, provided by the unit on call. It is useful because the so-called bleep is tagged with a 4-digit extension number. Every ward has a list with all the on-call doctors' names and a specified extension number, so communication is easy, fast, and costless".

7.3.2.4 T.V and radio media

One question posed to the interviewees was whether they followed some medical programmes by watching T.V. or listening to radio stations. Most of the interviewees disagreed that the information provided by these media was appropriate for them. Some of them said directed and commercial media provided general health information that was more appropriate for the general public. Others mentioned that their profession required them to look for evidence-based information, which was not available through these media. Also, some indicated that these media wasted their time.

An interviewee in Al Sabah hospital noted:

> *"I don't think they are helpful because the population who watch them need less than basic information and that is what they provide".*

In contrast, a few found that sometimes this media provided them with good information and they hoped to have some programmes provided by Kuwait TV. One interviewee from Al Amiri said:

> *"Sometimes, some American programmes like ER, and especially House, may suggest a different way to deal with problems, but information should be evidence-based".*

7.3.3 Interpersonal communication

7.3.3.1 Asking Pharmacists

The questionnaire result indicated that some doctors seek information from a pharmacist. The interviewees were asked about the value of this. Most of them indicated two main

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reasons: the availability and dosage of medication. Some of them added 'looking for information about the side effects of using some drugs'. For example, one interviewee in Al Farwania said he asked the pharmacist about:

"The availability of some drugs, the dosage, drug-to-drug interaction, any special precautions or adverse effects in complicated cases.
It's their subspecialty field which they know more about than me".

7.3.3.2 Asking ambulance staff

It was shown in the findings of the questionnaire that respondents sometimes asked ambulance staff for information, mostly when they were in the Emergency area. The interviewees emphasized the importance of the services of the ambulance staff. They mentioned that the ambulance staff provided them with necessary information such as the clinical picture when they first saw the patient, the urgent care procedures they undertook for the case and also the drugs and medication they may have given to the case. An Al Amiri interviewee and an Al Farwania interviewee provided an example of questions they asked ambulance staff, they said:

"If they brought someone who had lost consciousness,,,, did they measure glucose levels when they reached them?"
"We usually ask them questions regarding the mechanism of the injury of trauma victims. It's very important to assess the level of damage before we proceed, e.g. how did you find the patient? Was he conscious? Was there any bleeding?"

One interviewee in Al Farwania added that they sometimes needed ambulance staff to provide the history of a patient if they had obtained it from a patient's relatives or witnesses.

7.3.3.3 Meetings, workshops and conferences

Looking at the questionnaire findings, it emerged that respondents attended different types of meetings in their hospital such as daily, weekly and monthly meetings. Also, some respondents mentioned journal clubs and other meetings and workshops outside their hospitals. In the interviews, the interviewees revealed the purposes of attending the different types of meetings.

Daily meetings

Most of the interviewees had a similar response: that the daily meeting always emphasised medical issues such as discussing daily cases, their situation and progress. One interviewee in Al Amiri hospital said:

"We have a daily meeting in the early morning at 7:30 to discuss the on-call admissions and any updates about our patient situations and have meetings every day at 12:30 where we discuss different topics".

Weekly meetings

The weekly meetings usually focused on presenting up-to-date topics on their specialties. One interviewee in Al Farwania confirmed that and said:

"We discuss new medical topics in each meeting with its recent updates e.g. infections and antibiotics, newly discovered drugs and rare cases presented to our hospital".

Monthly meetings

The interviewees explained that the reason for the monthly meeting was to discuss mortality and morbidity. Some of them added that discussions of administrative issues were also a focus of these meetings.

Journal Clubs

Most the interviewees explained that the purpose of journal clubs was to engage in group discussions of hot and recent topics in their specialty. One interviewee from Al Amiri provided a comprehensive explanation. He reported:

"Different departments have different strategies. In paediatrics, we discuss a new drug that is released, with details, or evidence-based medicine. Usually the presenter is a senior. The same holds true for medical departments.
In surgery, which I am doing now, it's different to what is happing in other departments. We report cases with the latest studies related to it, usually the presenter is any doctor who has been following the case, and we run an open discussion, I was involved in a case. It is educational by definition".

Other meetings, seminars, workshops and conferences

The interviewees also provided details of other types of meetings such as workshops given by other departments in their hospital e.g. Radiology workshops, Anaesthesia workshops and nutrition and obesity workshops. Also, some of them added conferences and Continuing Medical Education (CME) seminars. One interviewee in Mubarak hospital said:

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"I attended CMEs related to internal medicine, or any of its subspecialties (e.g. respiratory, rheumatology, diabetes .. etc). Topics presented in CMEs are up-to-date and usually presented by highly-qualified speakers".

Then, the interviewees were asked about the benefits of attending the meetings, workshops and conferences. They mentioned several reasons such as improving their knowledge, keeping up-to-date with new medical information and enhancing their clinical decision-making. For example, an interviewee from Al Amiri said:

"It keeps me up to date, because sometimes I don't have the time to read and search for information".

7.3.3.4 Calls to other hospitals

The results of the questionnaire showed that sometimes doctors communicated with other hospitals when they practised in outpatient departments, wards and emergency areas. The interviewees explained the reasons for calling other hospitals including: e.g. a shortage of beds, ventilators or ICU beds when there are critical patients in need of such facilities, when urgent consultations are required for inpatients of specialties which are not available in their hospital (e.g. psychiatry, gynaecology, neurosurgery) and to arrange an inpatient transfer for selected cases, for example, to transfer patients who need urgent coronary angiography or an urgent pericardial tap to the chest disease hospital.

An interviewee in Al Farwania noted:

"We are a hospital yes ... but we don't have orthopaedics, neurosurgery, spinal surgery ... we deal with a lot of trauma victims which requires their assessment. And we have to call them".

7.3.4 Personal collection

7.3.4.1 Types of resources in the collection

The findings of the questionnaire indicated that most of the participants had a personal collection, which they used in the hospital. The interviewees were asked about the types of resources included in their personal collections. The interviewees mentioned various types of resources. Most have printed materials such as textbooks, reference books and pocket books whilst some have medical dictionaries, handouts from conferences, PowerPoint handouts from seminars and lectures, algorithm cards and summaries of old collections from medical school lectures. Only one interviewee from Al Amiri hospital indicated she had printed journals.

Also, the interviewees stated that they have various information and communication technologies. For instance they have computers such as laptops and Personal Digital Assistants (PDAs). One Interviewee in Mubarak hospital reported:

> *"My personal collection is in my PDA (a Palm Treo 680), which has an Internet connection".*

The interviewees added more ICT resources such as the Internet, databases, CDs and flash memory. Also, one interviewee in Mubarak hospital added:

> *"As for data systems, I use Excel and recently SPSS to register my patients, their demographic data and diagnosis".*

All interviewees indicated that they subscribe to some online journals such as NEJM, EMJ, the Lancet and Paediatrics. Also, some of them have electronic books in two versions such as online and CD. An interviewee from Mubarak hospital mentioned:

"I have e-Books such as MRCP and BNF available online as well as CDs".

7.3.4.2 Location of personal collections

The interviewees were asked where they keep their personal collection as well as where they use it. Most of them keep their personal collection in their home. Regarding the place where they use their personal collection, nearly all of the interviewees indicated that they used it frequently in the home and sometimes in the hospital.

"I mainly use it in my home but sometimes I use my personal collection in the hospital for case management and giving lectures" (Interviewee, Al Farwania hospital).

One interviewee from Al Amiri added another place, he said:

"At home and hospital, sometimes in the Faculty of Medicine".

However, the interviewees who reported having PDAs can access their personal resources in any place and at any time, as did those who had pocket books.

"I can access the Internet using my PDA whenever it is needed " (Interviewee, Mubarak hospital).

Another question asked interviewees if they used their resources when they communicate with their patients. Some of the interviewees who had PDAs and pocket books reported that they did. An interviewee in Mubarak hospital stated:

"When I see my patients, I just use my PDA,
which is in my pocket all the time".

Another interviewee from Al Amiri hospital said:

"Sometimes I use my resources in front of patients, for example if I need to know the
safety of a drug on a pregnant women, I use the drug index".

In contrast, some interviewees disagreed with using their personal collection in front of their patients, mentioning that they rarely used it when they see their patients. For example, one interviewee in Al Sabah hospital said:

"I rarely see the collection when I am seeing a patient. I might call a fellow doctor, but I
personally think that opening a book in front of a patient
undermines the doctor's character in the eyes of the patient, which may negatively
influence the treatment".

7.3.4.3 Organizing and updating the personal collection

The interviewees were asked how their personal collections were organized. Some of them mentioned that they organized them through folders and files on their laptop or PDA. One interviewee in Al Farwania hospital said:

"I have folders on my laptop and also I have sources in my favourites list on the
Internet".

Some interviewees had a manual index. Also some mentioned that they arranged some of their personal collection on shelves and in filing cabinets. For example, one interviewee in Mubarak hospital noted:

"I have some files on my PC which group some subjects, other than that I have my own books on the shelves".

Regarding updating their collection, the interviewees indicated that they update their own collection by taking out online subscriptions, purchasing new books, attending conferences and accessing the Internet. One interviewee in Al Sabah hospital noted:

"I spend money to update by keeping subscriptions for online journals and bookstore purchases".

Another issue explored by the interviewees related to the importance of using their personal collection. Generally, all interviewees emphasized the importance of using their personal collection because it satisfied their information needs. In addition, several benefits were indicated such as, help in practicing their profession, keeping them up-to-date with new developments in their specialty, improving their clinical decision-making, helping to manage patients, providing lectures and seminars and also as a good source to refer to for emergency cases. For example, one interviewee in Mubarak commented:

"Actually I have some handbooks in the hospital... I keep them for emergencies when I am on call, and a drug index".

One interviewee from Al Amiri provided the advantages of using his personal collection He stated:

"First of all, to confirm my information when in doubt. Second, to obtain up-to-date information and, finally, to reassure others when details are needed".

7.3.5 Departmental collection

The results of the questionnaire also illustrated that nearly half of the participants had departmental collections in their hospitals, and sometimes they used them in the outpatient department, wards and casualty areas. The types of information resources contained in their departmental collection were investigated in the interviews. Moreover, issues related to updating and organizing their departmental collections were also explored. Some of the interviewees mentioned they had a free online subscription to some websites as well as journals paid for by private companies. Also, some said they had collections of old books, journals, conference papers, leaflets from Medicare departments and plans and guidelines for some procedures from their hospitals. Some of the interviewees in Al Amiri and Mubarak hospitals added that their consultant colleagues are a part of the departmental information resources.

"We have our head of the units for consultation" (Interviewee, Al Amiri hospital).

The interviewees were asked about the value of using the information resources in their departmental collection. Most of them indicated they rarely obtained information from the departmental collection. The most common reason mentioned for the lack of obtaining information from a departmental collection was the collection's small size and outdated content.

The interviewees clarified the place where their departmental collection was kept. Most of them said they put their collection in their offices in the ward area.

In addition, the interviewees commented on updating the departmental collection. Most of them indicated that their departmental collection was not regularly updated because there was no specific person responsible for doing so. For example, an interviewee in Al Farwania hospital said:

"It is not regularly updated, it depends on personal interest. Anyone who is interested in sharing information provides the department with the latest information".

Another interviewee in Mubarak hospital said:

"We have an Internet connection from the Faculty of Medicine, so we have up-to-date online resources; we don't need to update it".

7.3.6 Statistical information

The interviewees were asked if they sought statistical information in their hospitals. Most of the interviewees indicated that they were unsure whether that information was available in their hospitals. One interviewee in Mubarak hospital said:

"I do some statistics by using my own SPSS, I'd love to have a data system to help research, for example, or for statistics".

Only two interviewees from Al Farwania and Mubarak hospitals obtained information from the statistical department.

"Yes we have a department for statistics and they help me in doing such statistics for my research and study cases" (Interviewee, Al Farwania hospital).

7.3.7 Drug literature

Another question was posed to the interviewees on the type of drug literature they have. They reported different types of resources such as BNF, Kuwait drug references, Martindale eBooks and other sources from online websites, medical schools and private companies and conferences. An interviewee in Mubarak hospital noted:

> *"I have electronic books which I have in my PDA including: Lexi-Comp drug index, David's drug index and Tarascon pharmacopoeia drug index".*

An interviewee from Al Amiri said:

> *"The Kuwait drug index, Clinical pharmacology by Page, BNF and www.rxlist.com".*

Another question asked of the interviewees concerned the importance of using drug resources. Most of the interviewees stated that they used the resources to look for side effects and dosage. Some added that they used them to teach their students. For example, an interviewee in Al Farwania said:

> *"I need to look for side effects, especially for pregnant women".*

7.4 Theme three: Use of intermediaries

Some of the interviewees indicated that when they faced difficulty in obtaining information in the library, on the Internet and in hospitals they used intermediaries for help. A few used Google to help them in searching. One interviewee from Al Sabah said:

"Sometimes I get lost when I search for a subject in online journals, so I access Google to find the subject or the lecture and then go further".

Others used their colleagues in the hospital and searched for information through the Internet. An interviewee from Mubarak hospital said:

"I have no problems using the Internet, if so I ask a colleague".

A few said they sometimes utilized librarians when they sought information in the library. Additionally, some of participants utilized porters or the nurses to translate for them when they faced language barriers in communicating with their patients.

"We really need a reasonable solution for this other than hiring a porter to translate for Asian patients" (Interviewee, Al Farwania hospital).

7.5 Theme four: Problems in obtaining information

The interviewees were asked about the problems they had encountered in obtaining information and also their satisfaction with information services in their hospital. Most of them mentioned the same categories as listed in the questionnaire. However, more detail was given in the interviews.

7.5.1 Internet use

Most interviewees revealed that cost, time constraints and the accessibility of the Internet were big problems. Only one interviewee in Mubarak hospital mentioned too much information and the unreliability of information as problems:

"Too much information is a problem, in addition non-professional sites that provide information. For example, there are sites that provide information for the general population rather than medical professionals and they waste your time reading through them".

On the other hand, some interviewees were happy with using the Internet. For example, an interviewee in Al Amiri hospital said:

"I use it both at home and work, no problem at all".

7.5.2 Language Barriers

Another problem raised by interviewees was the language barrier. Some of the interviewees revealed that language problems prevented proper communication with patients when trying to obtain important information such as patient history.

One interviewee Al Farwania has problems with Arabic patients because her first language is not Arabic. She said:

"I feel sad because my only problem is the Arabic language. I wish I could explain to my patient what I want to. But I manage with the help of my colleague nurses and doctors".

7.5.3 Communication with their colleagues

The main difficulty interviewees said they faced in communicating with their colleagues was the lack of information technology to facilitate that communication. In Mubarak, Al Sabah and Al Farwania hospitals, mobile phones are not provided by the hospitals. Thus,

the interviewees complained that they always had to use their personal mobile, which costs a lot. An interviewee in Al Farwania pointed out:

"I always use my personal mobile for consultations.
I pay 150-200 K.D (£300-400) per month".

Some doctors avoid using their personal mobiles, which means that they often cannot communicate with their colleagues. One interviewee from Al Sabah stated:

"Some might hesitate or decline to answer calls or call for financial or private reasons.
Having work-issued mobiles takes away the financial reason and obliges the doctor to
receive any call".

Also, some interviewees cannot communicate with their colleagues if they are working in the basement level. An interviewee in Mubarak hospital said:

"I have problems in communicating with my colleagues and other departments
especially because some departments in Mubarak hospital are located in the basement,
and it is difficult to connect with them".

The interviewees also mentioned that another obstruction to their communication with their colleagues was the lack of availability of email provided by their hospital or the Ministry of Health. They need emails to have the opportunity to communicate with their colleagues outside Kuwait for consultations and sharing of information.

7.5.4 Communication with other hospitals

The questionnaire results indicated that 52.8% of respondents had problems in communicating with other hospitals. The interviewees made clear their reasons for their

dissatisfaction with other hospitals. One of the main reasons provided by interviewees was the lack of ICT such as mobile phones, direct line contact numbers, fax and emails. Most of them were dissatisfied with the services provided by operators in the other hospitals. For example, one interviewee in Mubarak hospital said:

"I am dissatisfied with communication with other hospitals because hospital operators never answer!!!! We cannot connect to the person of interest in the other hospitals unless we have his/her direct number".

Another difficulty pointed out by the interviewees was that of receiving wrong and incomplete patient information from the other hospitals. For example, an interviewee from Al Amiri hospital noted:

"When they send patients to our hospital, they send the wrong information about the patients' case".

7.5.5 Attending meetings, seminars and conferences

The interviewees also clarified their reasons for their dissatisfaction with attending meetings or seminars or conferences. Some of them were disappointed with the quality of the information on the topic and the presenter's style.

"I am dissatisfied with daily, weekly and monthly meetings because not all are presented in an evidence-based manner. Mostly they are presented as an old fashioned, textbook presentation, which lacks up-to-date information" (Interviewee, Mubarak hospital).

Others indicated that there was a lack of time to attend meetings and conferences. For example, one interviewee in Al Farwania hospital said:

"Sometimes the topic is not interesting enough. Sometimes we are too busy in the ward to attend".

7.5.6 Healthcare Information System

The interviewees also indicated some dissatisfaction with the Healthcare Information System. Most of the interviewees revealed several problems with using the system. In Mubarak and Al Amiri hospitals, the interviewees complained that the system cannot retrieve old data about the patient. One interviewee in Al Amiri hospital stated:

"We cannot request back the data we saved for a patient in a previous admission due to the deficiency of back-up storage".

Others criticized the system for not providing them with statistics. For example, an interviewee in Mubarak hospital said:

"It is ridiculous as you cannot retrieve any information from it and you cannot use it for statistics or research".

In addition, some of interviewees mentioned another problem of the system, that of the duplication of data.

"There are a lot of data duplicated. For example,
let's say a patient remained in the hospital for a month and he was given several
antibiotics and heart or diabetes medication, all the drugs will be mixed together and
you need 30 minutes to figure out what the patient is currently taking!
The medications have a limited time so every time the medication time passes we have to
re-enter it and it will be duplicated. One of my patients had over 100 drugs on the list"
(Interviewee, Mubarak hospital).

Also the system cannot show lab results and X-rays and other forms such as admission notes and patient progress. One interviewee in Al Amiri hospital commented:

"No access to lab or radiology data ……... In other hospitals, like Al Farwania, they computerized the admission notes and patient progress; we don't have these options on our system".

Al Farwania interviewees encountered several technical problems, such as the system being down and slow. It was also time-consuming to learn to use the system, and there were problems in printing some forms. An interviewee reported:

"We are facing many technical problems such as recurrent system shutdown with delays to repair the problem by the technician staff.
I took 1 month to be familiar with the system software.

Also, we have problems with the printer and plain A4 paper. We are consuming more than 20 – 40 pages of A4 paper for each patient. It is too costly for the Ministry to buy a new printer ink cartridge and a box of A4 paper weekly".

7.5.7 Library use

The interviewees in Al Farwania and Al Amiri hospitals complained about the small and old collections in their hospital libraries. One interviewee in Al Farwania said:

"We have a very small, old library with resources from the '80s which are useless nowadays".

In addition, most of the interviewees indicated that the best library to visit was the Health Sciences Libraries in Kuwait University, but they found it difficult to reach the

library for three reasons: lack of time, distance from their hospital and the opening hours of the library. An interviewee from Al Sabah said:

"The only two good places are in the medical faculty in Jabreya and KIMS, but they are far away and close early".

Others preferred online libraries. For example, an interviewee from Mubarak hospital mentioned:

"All the journals and learning videos are on-line and books are not used frequently as I have my own collection. I can access the library on-line".

7.5.8 Communication with other departments

A few of the interviewees were unhappy with their communications with other departments in their hospital such as the laboratory and X-ray and with other paramedics. They mentioned two reasons involving uncooperative staff and the delay in sending results. For example, an interviewee in Al Sabah commented:

"I am dissatisfied with communications with other departments in my hospitals, they don't cooperate; some people are not professional enough to honour their moral and professional obligations".

Also, some interviewees were dissatisfied with the services provided by medical records with problems including a lot of missing files, incomplete information, disorganized forms, unprofessional clerks and delays in sending the files.

7.5.9 Communications with the patient

The interviewees also had some problems communicating with their patients, including language barriers with patients who do not speak either Arabic or English. Also, a lack of awareness of some patients regarding health information issues caused conflict between the doctors and patient in discussing diagnoses or treatment plans. In addition, the patients sometimes sought health information from unauthorized people such as in social gathering places (Dewaniya) and this makes the patient listen to inaccurate health information, which, in turn, affected their communication with their doctors.

One interviewee from Al Amiri pointed out:

"People tend to believe 'Dewaniya' more than doctors, which is an unusual trend".

Also, some interviewees faced difficulties in gathering information from patients and patients' parents or relatives. They do not cooperate with doctors to provide them with the medical history.

7.6 Theme five: Improving information resources & services

A variety of suggestions and recommendations were proposed by the interviewees. They were intended to improve the current information provision system in Kuwait hospitals. They were:

- Health education for patients. The patient needs to be aware of some of the principle issues related to her/his health. This can be achieved by: improving the health education for patients through providing booklets, leaflets, pamphlets, handbills, and posters in hospitals and public areas; giving seminars and lectures

in the hospitals and schools; providing commercials and advertisements on T.V. and radio; developing the healthcare website of the Kuwait Ministry of Health; providing an email subscription to send free medical advice and providing free general health information through newspapers. One interviewee in Al Sabah hospital suggested:

"I think first of all we should have a department for health education with specific people using many ways to educate the public, like TV announcements or newspapers, or at least brochures in the hospitals".

- Provide more courses, seminars, workshops and conferences. Doctors emphasised the importance of having more meetings, courses and conferences in their own and other specialties.

"Provide more courses for CME" (Interviewee, Mubarak hospital).

Another interviewee from Al Amiri hospital recommended:

"Well, we never received a training workshop like advanced cardiac life support (ACLS), advanced trauma life support (ATLS) or even training directed at different levels".

- Improve the quality of staff performance in the hospital libraries, medical record departments and ambulance staff. For example, an interviewee in Al Sabah suggested:

"Updating all staff in the ER through different courses e.g. cardiac support, trauma support, provided in Kuwait and outside Kuwait".

- Provide CDs, DVD, and printed materials of conferences, seminars and lectures.

- Motivate doctors for information provision. One interviewee in Al Amiri suggested:

"Rewarding active doctors in scientific meetings even by a note of thanks".

- Provide information statistics for aiding research and studies.

"Develop a patient data system for studies and statistics" (Interviewee, Mubarak hospital).

- Solve language barriers by employing an official translator and distributing leaflets of principle health information in different common languages. For example, one interviewee in Al Farwania hospital suggested:

"I developed recently a summary of terms that are FAQs in our clinic, I wrote them in different languages such as Indian, Bangladeshi".

- Updating library resources in hospitals which have a library, by supplying the library with recent journals, medical databases, indexes for books and professional librarians. Also, establish a library in hospitals which do not have one.

- Improve the services of the Healthcare Information System. The system needs to have complete information and a recovery backup system. For example, one interviewee in Mubarak hospital suggested:

"It needs a better infrastructure, and the software needs to be improved".

Another interviewee in Al Farwania hospital recommended:

"Changing the printing work to a simple, time-saving and cheap system by using the Bar Code & small labelled identification data of each patient".

- Implement the Healthcare Information System in all hospitals in Kuwait. One interviewee in Al Sabah reported:

"Having a good electronic system to share some of the patients' history data, their progress, investigations, results would be a great benefit to the overall well-being of the patient".

- Supply accessible Internet to all hospital departments with online medical databases.

- Improve communication between doctors by giving internal mobiles, the paging system and emails.

- Improve communication with other hospitals in Kuwait and outside Kuwait by using information technology such as emails, fax, telephone and the Internet. In addition, link the Healthcare Information System by LAN and WAN connections. For example, one interviewee in Al Farwania hospital said:

  "I think each hospital should have a site with all the staff names and contact information".

- Better management of information.

  "A new administration sub-department, which is responsible to develop strategies, to update and educate doctors clinically and theoretically"
  (Interviewee, Mubarak hospital).

- Have a complete information provision system. For example, some doctors shared their previous experience when they were studying or working with different systems outside Kuwait.

  "I worked for 6 years in Canada. Their system was impressive. We had Internet connection 24 hrs/day, all paediatric journals and sub-specialty subscription with full free access, a big library in the hospital close to all wards.

Their patient registry is computerized and easily accessed and used Excel, so for any statistic you just ask the secretary to prepare the file for you" (Interviewee, Mubarak hospital).

7.7 Summary

The research was progressed by using interviews to discuss some of the more interesting issues in more depth and to give a clearer picture of the research problems. The interviewees clarified the reason for keeping up-to-date with information for maintaining good practice. A personal collection was the most useful source of information used by interviewees for their medical practice. The interviewees mentioned some examples of personal information technologies including: PDAs, laptops and pocket books, which help the participants to access information in any place at any time. A lack of ICT to communicate with colleagues was the problem indicated by most of the interviewees. Also, language barriers, time constraints and lack of awareness were common problems in the doctor-patient relationship. It was unexpected to find that most of the interviewees were unaware of the availability of some information sources in their hospital e.g. the statistics department. Finally, the interviewees suggested the provision of health education for the patient as a means of improving the information provision in Kuwait hospitals. That is could be through providing seminars inside hospitals, public media (T.V. and newspaper) and brochures.

The findings of the three stages: focus groups, questionnaires and semi-structured interviews provided a range of different opinions and facts related to the research problem. The next chapter brings together the results of the three stages and evidence

from the literature review. These are then discussed in the light of the research questions,

aims and objectives.

Chapter Eight

Discussion

8.0 Introduction

The aim of this chapter is to collate and discuss the three stages of the data collection results: focus groups, the questionnaire and the interviews. The results are discussed in the light of previous research outlined in the literature review in chapter three and other literature added to address new issues that emerged from the results. The first section discusses the overall information needs of doctors. The second section explores the information-seeking behaviour of doctors in Kuwait government hospitals and associated issues, including the problems that hinder doctors when seeking information. The third section addresses doctors' ideas and suggestions for improving the current information provision in Kuwait government hospitals. The last section presents the models that have emerged from the results and compares these with previous models

discussed in the literature review. The chapter concludes with a summary of the key outcomes of the study.

8.1 Information needs

The focus group findings assessed the information needs of doctors from a user perspective and the results provided an overview of the different categories of information need. All participants revealed that their profession required information and that they cannot practise without information. They added also that in everyday practice they needed information to be familiar with common diseases, treatments, diagnoses and therapies. Their views are supported by Sackett *et al.* (2000) who described doctors' practice activities by outlining eight principle tasks: etiology (identifying causes of diseases or conditions), clinical findings (gathering and interpreting findings from a patient's history and physical examination), diagnostic tests, differential diagnoses, prognosis, treatment, prevention and self-improvement (keeping up-to-date or improving skills). It seems that information is not only a personal need for doctors but it is also a large part of their job description and it is an essential tool in their profession. This finding also corroborates the results of previous studies indicating that the nature of a doctor's professional activity requires up-to-date information. Hersch and Lunin (1995) point out that most of a doctor's time is spent recording and synthesising information. Smith (1996, p.1062) supported that and pointed out that when doctors communicate with patients they "use some two million pieces of information to manage patients". Bryant (2004) pointed out that there were two primary needs that push doctors to seek information: professional responsibilities and personal characteristics.

In addition, the participants in the focus groups in this study added three main needs for information: a) to keep up-to-date with advances and improvements in their speciality; b) to assist and improve their clinical decision-making; and c) to communicate with their colleagues for sharing knowledge and experiences. Also, some of them needed information for writing reports and making the presentations that are discussed in weekly or monthly seminars and meetings. All these categories, and other categories of doctors' information needs emerging from the literature, were assessed through the questionnaires and interviews. The results showed that respondents needed information for different reasons, but the majority of respondents (91.9%) needed information for keeping up-to-date followed by continuing education (78.9%) and improving their clinical decision-making (74.5%). The results are similar to the findings of Pyne *et al. 's* (1999) study, which show that 80% of doctors need information for keeping up-to-date. Similarly, the survey study of Ocheibi and Buba (2003) found that keeping up with current information to improve knowledge was the need most frequently mentioned by participants. Conversely, the results of the present study diverged from those of other studies which indicated that clinical purposes, such as clinical decision-making and patient management, were the most frequently mentioned reason for doctors to seek information (Bryant 2004, Bellman *et al.* 2005, Lappa 2005, and Cheng 2004).

Although the questionnaire showed that the majority of the respondents needed information for keeping up-to-date, the interview findings provided more detail about the issue of doctors' information needs. Most of the interviewees agreed that keeping up-to-date with current information and development is the most essential need because they must ensure that they are making the best clinical decision for patient management and care, which will contribute to good practice. Therefore, good practice can be achieved through keeping up-to-date with current information. One interviewee said:

"Medicine is dynamically changing and my best management for the patient will depend on my follow up of new changes. Also, I need to give appropriate advice for special circumstances which need intensive and expert advice that is not available in trials".

In fact, keeping up-to-date is an essential requirement in doctors' medical practice and demanded by many government standards and proved by Palmer *et al.* (2002, p. 345) who provided guidance for occupational doctors on good medical practice. One of the standards stated the requirement of keeping up-to-date:

- *"You must keep your knowledge and skills up-to-date and appropriate for all areas of your practice throughout your working life. In particular, you should take part regularly in educational activities which maintain and further develop your competence and performance.*
- *Some parts of medical practice are governed by law or are regulated by other statutory bodies. You must observe and keep up-to-date with the laws and statutory codes which affect your practice".*

Similarly the UK General Medical Council (2006, p.6) identified the qualities of good doctors:

"Patients need good doctors. Good doctors make the care of their patients their first concern: they are competent, keep their knowledge and skills up-to-date, establish and maintain good relationships with patients and colleagues, are honest and trustworthy, and act with integrity".

In addition, González-González *et al.* (2007, p.345) explained the relationship between keeping up-to-date and good practice. They stated that doctors cannot improve their performance if they fail to keep abreast of current issues in their speciality to improve their knowledge.

The findings of this study indicated that the association between the reasons for doctors' information needs and their total years of working experience was not statistically significant for almost all reasons for information need, except the reason of needing information for teaching staff or students or colleagues. The results showed that doctors who had a greater number of years of working experience were more likely to need information for teaching students or staff or colleagues. It seems that working experience is an important factor required for teaching purposes. Figure 8.1 shows a summary of the overall information needs of doctors.
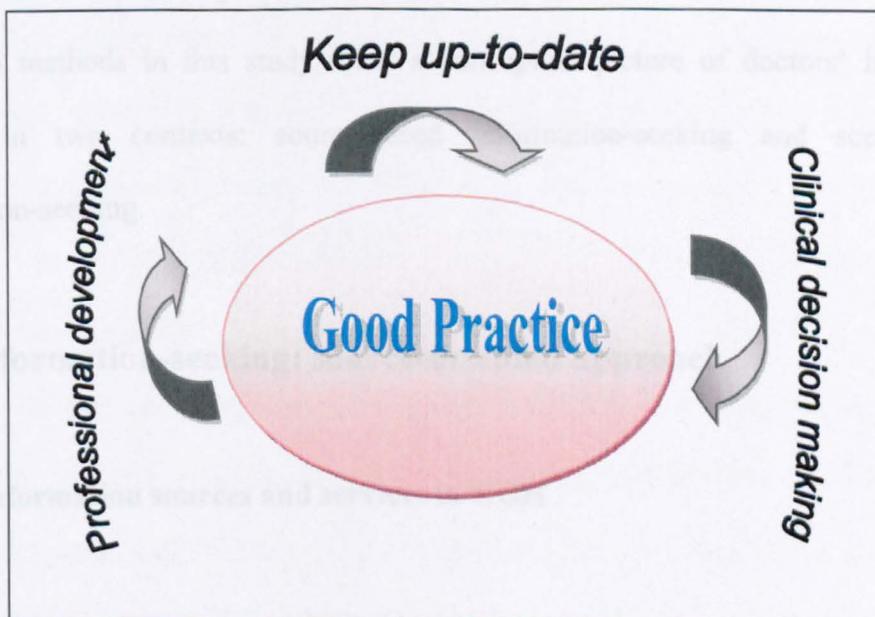
Figure 8.1: Overall Information needs

It was obvious from the above discussion that doctors needed information for several reasons; however, the most frequently mentioned information need was keeping up-to-date. In addition, there were two other important needs: improving their clinical decision-making and professional development such as continuing education and writing reports. All these core needs are clearly related to maintaining good practice.

Participants in the focus groups indicated that, in order to satisfy their information needs for their medical practice, they usually obtained information from several channels of information sources. This issue is the focus of the following section.

8.2 Information-seeking behaviour

One theme of this study is to show how doctors in Kuwait government hospitals obtain the information they need. As shown in the literature review, the information-seeking of doctors has been investigated in different contexts. The results of the three data-collection methods in this study draw a conceptual picture of doctors' information-seeking in two contexts: source-based information-seeking and scenario-based information-seeking.

8.2.1 Information-seeking: source-oriented approach

8.2.1.1 Information sources and services in KGH

The results of the study have detailed the type of information sources and services available in Kuwait government hospitals: hospital libraries, departmental collections, the Internet, online databases, annual reports and statistics and personal collections. Three critical factors emerged from the results. Firstly, some participants in the focus groups and interviews were unsure of the range of information sources and services available in their hospitals. The questionnaire results confirmed this and showed the unexpected outcome that only 20% of the respondents indicated that they had annual reports and statistics provided by the statistical departments in the hospitals. Most of the

interviewees were unaware of the availability of this resource in their hospital. For example, one doctor mentioned that she used Microsoft Excel spreadsheets to enter her patients' data on her laptop. She indicated that she used Excel's simple statistical functions to run some statistics, such as the frequency of diagnoses and treatments, to help her in her medical research. There is evidence in the literature of the use of Excel in the management of patient data for clinical research and statistics (Lee, Chang, and Oh 2006). Only two interviewees were aware of the availability of statistical resources provided by the statistical department of each hospital. They indicated that they usually communicated with the statistics departments when they were working on their research or when they needed statistical information to present at seminars or meetings. In fact, the statistical department is one of the sub-units in the Medical Record Department and perhaps doctors were unaware of the different information services it provided. Another assumption is that doctors possibly have less need for population statistics and perhaps have a greater need for information about individual patients. The study conducted by Lundeen, Tenopir and Wermager (1994), which investigated the information needs of rural health practitioners in Hawaii, found that doctors indicated they had less need for population statistics (i.e. public health research). However, they had a great need for information on clinical trials and medical research. In contrast, Thompson (1997) stressed the importance of population statistics for doctors so that they can provide their patients with accurate prognoses and suitable preventive health advice. Population statistics present a large segmentation of individual patients. Familiarity with this type of information will help doctors maintain awareness of common diseases and conditions in society, which will help their clinical decision-making.

Secondly, it seems that there is a lack of knowledge resources (e.g. Internet, electronic resources and hospital libraries) provided by the hospitals and it was obvious that a

personal collection is the core of the knowledge resources used by participants. It was found that a personal collection, consisting primarily of electronic resources, was the source most frequently reported by the respondents (81.9%) in the four hospitals while the other information sources were little used. For instance, a very small number of the respondents indicated that they had any online databases in their hospitals and when they did, they were usually free databases provided by private companies for a trial period. Also, only around a half of questionnaire respondents indicated that they had a library in their hospital. The results of the interviews indicated that whilst Al Farwania and Al Amiri hospitals had libraries, Mubarak hospital did not. Although the focus group participants who were working in the Internal Medicine Department in Al Sabah hospital stated that no library existed in their hospital, some of the respondents to the questionnaire in Al Sabah hospital reported that they had a library. The interview results provided detail on this issue and showed that there were two departmental libraries; in the Dermatology and ENT departments. Possibly, the lack of awareness of the existence of libraries in their hospital was due to the fact that the Al Sabah hospital building is divided into different small buildings and the departments are scattered between them, making communication difficult between the departments. This may affect doctors' awareness of the availability of information resources in the hospitals.

Finally, information resources are not distributed equally between departments in the hospitals. For example, the accessibility of the Internet was very limited. Around half of the questionnaire respondents reported they had the Internet in their hospitals. The results showed that the Internet was available in all hospitals but the participants in the focus groups and interviews argued that it was accessible only in some areas. For example, it is available in some doctors' offices in the ward areas and in the offices of the consultants and heads of departments. Similar findings were appear in Tan *et al.'s*

(2006) study; doctors complained that the Internet and computers were available in some areas, such as outpatients and wards, and used only for clinical problems.

The above discussion provided a general idea of the information provision and the type of information sources and services that exist in Kuwait government hospitals. The next section discusses the details of how doctors obtain and interact with the different information sources and services.

8.2.1.2 Use of information sources

The results of the present study show that doctors sought information from a range of sources inside and outside the hospitals. Principally, participants in the focus groups indicated two main types of information they usually seek: patient data and knowledge-based information. They also indicated other types of information such as statistical information, administrative and logistical information. The sort of information sought was somewhat similar to Gorman's (1995) typology, which categorizes the information sources sought by doctors into five types: patient data; medical knowledge; logistical information; population statistics and social influences. The results of this study demonstrate how doctors use the information sources to obtain the information they need. Some associated issues were investigated for some information resources including: reasons for seeking the information, frequency, the place where they most frequently seek; how they keep and update the resources used and the problems they encountered in using the information sources. All these issues are discussed in the next section.

8.2.1.2.1 Medical records and Healthcare Information System

It was found that patient medical records were the main source used for obtaining the necessary patient data by participants. The questionnaire results confirmed this and demonstrated that nearly all of the doctors used patients' medical files for reading a patient's history and for recording patient data. A few respondents also used them for research purposes. These findings from the current study are consistent with most previous work such as that by Osheroff *et al.* (1991) who pointed out that about half of the information that a physician needs to treat a patient can be found in their medical record. Similarly, Gorman (1985) stated that patient data are usually obtained from the patient and his or her family or friends and his/her medical record. As evidenced by the literature review, few studies found the use of paper medical records by doctors to obtain the necessary patient data. Indeed, the growing use of information technology in the healthcare environment has shifted research attention towards the study of health information systems such as electronic patient records and related issues, including system implementation, use and evaluation. Jensen and Aanestad (2007, p.29) stated that:

"In recent years, there has been an increasing demand for exploiting the possibilities of IT in healthcare. Hospital managers perceive IT as the key tool for achieving a better information flow and better services, as well as for complying with organizational objectives regarding high quality in patient care and treatment. In many hospitals, the focus is on the Electronic Patient Record".

As was noted in chapter two, the Ministry of Health in Kuwait has started to implement computerised patient medical records in Kuwait government hospitals in the form of the Healthcare Information System. The results showed that the Healthcare Information System (HCIS) was available in all hospitals except Al Sabah hospital. The results

demonstrated that the progress of the system was different in the three hospitals. It had only recently been introduced in Mubarak hospital at the time of the primary research and used only for entering data such as patient diagnosis, progress and medication and writing discharge summaries. The system had been implemented more fully in Al Amiri and Al Farwania hospitals and was used to enter patient data and the results of investigations, e.g. laboratory tests. In Al Farwania hospital, the system was also used to share X-rays results. The reasons for using the system are similar to those of the survey study conducted by Lærum, Ellingsen and Faxvaag (2001) in Norwegian hospitals, which showed that doctors mainly used the patient record system for reading patient data. Bernstein (2007, p.22) pointed out that Electronic Health Records functioned for "managing treatment most efficiently, monitoring patient compliance and treatment regimes, and gaining easier access to real-time patient diagnostic information for better patient treatment".

The questionnaire results demonstrated that more than half of the respondents were dissatisfied with the Healthcare Information System (HCIS). The interviewees stated their problems in using the current Healthcare Information System. In Mubarak and Al Amiri hospitals, the interviewees indicated problems with the duplication of patient data. The system does not have a function to retrieve old patient data, so doctors noted that they frequently repeated entering patient information for every admission. Other problems were that the system does not show X-rays and laboratory investigations and it did not provide a statistical summary of cases. Also, interviewees said it was time-consuming to input the patient data in both versions of the patient's medical record: paper and electronic. This will affect the consistency of patient information. Both Mikkelsen and Aasly's (2001) and Stausberg *et al.'s* (2003) studies had similar results and stated that the parallel use of paper and electronic patient records affected the

consistency of clinical documentation. Mikkelsen and Aasly (2001) pointed out that both electronic and paper versions of a patient's medical record should work together and ensuring the validity of both versions should be a priority.

The main problems with the HCIS indicated by most of the interviewees in Al Farwania hospital were technical, such as the system being 'down' and slow, a lack of training courses explaining how to use the system and problems in printing out some reports. This raises some issues. Perhaps, the HCIS suffers from system immaturity and needs to be upgraded. It suggests also that doctors may be resistant to change, which is a common barrier to the introduction of a new system in any organisation. The recent study conducted by Reed 2007 and Lorenzi *et al.* (2009) pointed out the barriers to the successful implementation of Electronic Health Records. Cultural resistance, such as doctors' resistance to change, and also vendor product immaturity were some of problems affecting successful EHR implementation. A further possibility is that the doctors in this study need more training to use the system and to become familiar with the system functions.

The questionnaire results of the current study, along with the views of participants in the focus groups and interviews, showed some dissatisfaction with the services provided by the medical record departments in their hospitals. The most common problem mentioned by participants was inaccessible and missing patient files. For example, doctors sometimes saw patients in outpatients without medical records and this resulted in incomplete patient information and documentation, which affected following the progress of patient information on the next visit. Another problem revealed by participants was that the forms in the medical record were disorganized, for example, some inpatient forms were placed in the outpatient section. Also, a few of the

participants reported unprofessional clerks and delays in sending the files. The results were consistent with the questionnaire findings where the problems most commonly noted were unorganised forms and missing patient files. The problem reported least by questionnaire respondents was lack of help from medical record staff. In fact, all the problems identified by the doctors emphasise the most common disadvantages of paper patient records. This is supported by Uslu and Stausberg's (2008) study which outlined some common problems of paper-based patient records: inaccessibility, missing and incomplete information, data redundancy, and consuming space for archiving. Also Hameed *et al.* (2008) indicated other problems of using paper patient records such as the lack of backup for paper medical records when they are lost and the large number of forms, which, when allied to the shortages of staff, lead to difficulties in recording all the patient's data and the possibility of some information going missing.

8.2.1.2.2 Hospital libraries and other medical libraries

The questionnaire results showed that around half of the respondents visited the Health Sciences Centre Library in the Faculty of Medicine at Kuwait University yet. Only 11.5% seek information from hospital libraries. In addition, approximately half of the respondents did not visit any library. The results were similar to those of Ocheibi and Buba (2005) who found that more than half of their respondents did not use the libraries (Medical Library of the University of Maiduguri; libraries in private hospitals and government hospitals). Doney, Barlow and West's (2005) study also supports this and indicated the low use of libraries. The study also reflects other reports of the low use of medical libraries (Childs 1988, Owens and Tomlin 1998, Stavri 1996 and Bryand 2004). On the other hand, the results contradict those that indicated that the source of information sought most frequently by doctors in the hospital was the Health Sciences

Library and hospital libraries (Lundeen, Tenopir and Wermager 1994 and Khudair and Cook 2008). A critical concern found in the results of the questionnaire in this current study is that, although the Kuwait Institute for Medical Specialization (KIMS) library is supported by the Ministry of Health, only five participants reported that they visited it. As indicated in chapter two, the library has a large range of collections consisting of more than 5,300 books and subscribes to 550 periodicals and also to the MEDLINE Network and has opening hours from 8:00 am to 8:00 pm. Perhaps that KIMS library's location in the town centre of Kuwait City, an area with very congested traffic, makes it difficult to visit the library. Another assumption may be that doctors are not interested in visiting the library and they prefer to use their personal electronic collection.

Although there have been a number of studies that have explored the value of the information provided by hospital libraries and their impact on clinical decision-making (Marshall 1992, Burton 1995, Urquhart and Hepworth 1996, King 1987, Casado *et al.* 1994, Ali 2000, Cuddy 2005), the results of the present study indicated a different outcome. The focus groups and interview results showed that the most frequent need leading to a doctor obtaining information from the library was writing reports, research papers and presenting a case. The questionnaire results supported that and indicated that only 26.7% of the respondents frequently obtained information from the library for improving their knowledge. However, more than half of the respondents sometimes needed information from the library to answer colleagues' questions, for continuing education and writing reports/research/articles. Very few respondents (15.5%) reported 'frequently', and less than half of respondents reported 'sometimes', using library resources for clinical decision-making and keeping up-to-date. These findings are corroborated by those of the studies in the literature review reporting low use of library

resources for clinical decision-making and immediate patient care (Owens and Tomlin 1998 and Doney, Barlow and West 2005).

The results of this current study showed that the frequency of visiting the selected library was between 'rarely' and 'monthly'. This result does not therefore support those of earlier studies that indicated the frequency of visiting hospital libraries was weekly or more (Marshall 1992 and Burton 1995). Certainly the rapid increase of ICT resources (e.g. the Internet) in the healthcare environment allows the accessibility of health information more easily and at any time and in any place. Thus, using the libraries and printed materials is receiving less attention in the literature. However, the use of electronic resources and technologies is receiving great consideration. The advance of IT in the Arab region is still not extensive and there remain some challenges and motivation in using ICT (Al-Shorbaji and Nour 2001, Al-Shaya 2002, Khudair and Cooke 2008). Another assumption, that the main reason attracting doctors to visit the medical libraries is for teaching and research purposes, was also confirmed by the study conducted by Ur Rehman and Ramzy (2004a) who indicated that the use of the Health Sciences Centre Library at Kuwait University by doctors (full and part time) was linked with their teaching and research responsibilities. They found that 66.1% of doctors visited the library 'extensively' and 26.6% reported doing so 'frequently' and that not one of the respondents indicated that they never visited it.

The participants in the focus groups and interviews indicated that they frequently seek serials (e.g. journals, periodicals and magazines) and books in the library. Also, some of them said they frequently sought resources on the Internet and databases such as MEDLINE. These results are consistent with the questionnaire outcomes, demonstrating that 77.2% sought serials e.g. journals, periodicals, magazines and newspapers in the

library. Also, most of the respondents sought books, more than half of them reported accessing the Internet and 41.1% reported using databases (e.g. MEDLINE). A very small number of the respondents reported seeking government publications and statistics and annual reports in the library. These results are similar to those of Burton (1995) and Ocheibi and Buba (2003) who found that journals and books were the most frequently sought source of information by doctors in the hospital libraries.

It was found that the tools used most frequently by respondents to access library resources were abstracting journals and indexing journals. An unexpected finding was that less than half reported calling for assistance from the librarians, although the literature shows the role of medical librarians and informationists is crucial in assessing doctors' information needs (Lappa 2005, Freeth and Smith 2003 and Brookman *et al.* 2006). However, the role of librarians and information professionals in this current study was less effective in helping doctors to search the Internet and use online resources. The interviewees in this study indicated that they sometimes called for help from librarians to help in finding a book or journal title. The results resemble those of Ocheibi and Buba (2003) who indicated that 41.8% of doctors used medical doctors for assistance in literature searches in the libraries and 32.9% of them used assistance from librarians. Also, the results of Khudair and Cook's (2008) study show that clinicians were less likely to call for assistance from library staff to access electronic services in the library and most of them preferred to use the electronic services by themselves. Most of the studies that have investigated the role of informationists have been conducted in Western countries; perhaps cultural issues and the advances in information technology are crucial factors in enhancing the new role of the informationist as an important member of the medical team, working side-by-side with doctors to improve clinical decision-making and providing optimal healthcare for patients.

Another issue that arose was that some interviewees indicated that the staff in their hospital libraries were unqualified. They said that most of them have business and management degrees and know little about library science. These results support those of Al-Ansari and Al-Enezi (2001) who conducted a wide study that examined the status of seventeen health sciences libraries in Kuwait in terms of their staff, collections, facilities, use of information technology, information services and cooperation. The results showed that most of the health sciences libraries in education institutions had a larger collection than government hospital libraries. Also, the results of their study showed that the majority of library staff was non-professional and they provided only basic information services. Also, a significant number of health sciences libraries are not automated.

The results of the three data collection methods outlined the barriers leading to the low usage of the hospital libraries. More than half of the respondents in the questionnaire were dissatisfied with the services provided by their hospital libraries. Most of them were from Al Amiri, Al Farwania and Al Sabah hospitals. Participants in the focus groups and interviews clarified that and indicated that they rarely visited their libraries because the collections were small and outdated. The questionnaire results supported this and showed that Al Amiri and Al Farwania hospitals had high percentages reporting inadequate resources. Also, around half of the respondents in Al Sabah hospital also reported inadequate collections in their departmental (Dermatology and ENT) hospital libraries. In contrast, some interviewees from Al Sabah hospital, who were dermatologists, reported satisfaction with their departmental library. They stated that they frequently visited their library to access the Internet but said that there was a lack of online journals. Possibly the availability of electronic resources such as the Internet encouraged them to visit the library. The reasons for not using hospital library resources

were similar to these reported in the study by Ocheibi and Buba (2003) who indicated that the outdated resources in the library were the major barrier to its use by doctors.

Another problem indicated by doctors in this study was that hospital libraries did not exist in their hospitals. Although the questionnaire results showed that less than half of the respondents reported that, and most that did were working in Mubarak and Al Sabah, the Mubarak interviewees were less dissatisfied with the lack of availability of a library in their hospital than were the Al Sabah participants. The result was not surprising because participants indicated that they often visited the HSCL, which is behind their hospital. Although participants in the focus groups and interviewees in the four hospitals revealed that they thought that the HSCL was rich in electronic resources, time constraints, the long distance from their hospital and the opening hours of the library were major difficulties hindering them visiting the HSCL. Time constraints were one barrier preventing visits to hospital and medical libraries indicated in some previous studies (Owens and Tomlin 1998, Bryand 2004 and Lappa 2005). In addition, Bryant (2004) indicated that opening hours and distance were the key factors inhibiting doctors visiting the local library.

8.2.1.2.3 ICT resources

Although the results showed a lack of ICT resources in Kuwait government hospitals, the doctors interviewed indicated a heavy reliance on using ICT resources. The questionnaire results supported this and showed that almost all respondents indicated that they used the Internet. The Internet is an extremely powerful information resource used by almost all doctors as indicated in previous studies (Bennett *et al.* 2004, Casebeer *et al.* 2004, Doney, Barlow and West 2005 and Ajuwon 2006). Nearly all of the

interviewees in this current study accessed the Internet on a daily basis. This finding supports that of Khudair and Cook (2008) who found that the majority of their respondents accessed the Internet daily. In contrast, Casebeer *et al.* (2002) found that although high percentages of doctors reported access the Internet monthly, only 8% reported daily access.

It was found that nearly all of the respondents accessed the Internet at home. Only 36.4% of the respondents used the Internet in the hospital and a very small number accessed it in the hospital library or an Internet cafe. The results support those of Bennett *et al.* (2006) who found that doctors often accessed the Internet at home after work hours. In contrast, Bellman *et al.* (2005) indicated that the most common location to access online medical references was at work during scheduled hours. Also, in the Ajuwon (2006) study, doctors reported the last location from which they accessed the Internet. 76% of the respondents reported cyber Cafes.

The low of use the Internet in the hospitals raises two critical issues. First, since doctors are very busy people, they do not have time to access the Internet in the hospitals. Most of the interviewees revealed that time is the critical barrier affecting access to the Internet in the hospital. Time constraints on searching online resources were similarly indicated by several previous studies (Dawes and Sampson 2003, Andrews *et al.* 2005, D'Alessandro *et al.* 2004, Green and Ruff 2005, and Bellman *et al.* 2005). The interviewees added that their environment also affects them accessing the Internet in the hospital. They said they work in different areas in the hospitals, which makes the workload heavier, and it is difficult to find time to access the Internet. This is also supported by Tan *et al.* (2006) who indicated that clinicians working in hospitals

claimed that time was very precious to them and that electronic resources were used only for clinical care work.

The second issue is that the Internet is not accessible in all departments in the hospitals. Participants in the focus groups and interviews revealed that the inaccessibility of the Internet hindered them in seeking the information they needed in the hospital. Similarly, the questionnaire results showed that around half of the respondents were dissatisfied with the accessibility of the Internet in their hospitals. Another problem indicated by the participants in this study was the high cost of accessing the Internet and also the high cost of subscriptions to electronic journals. Around half of the respondents to the questionnaire reported this problem. Also, most of the interviewees indicated that they did not have free online journal subscriptions provided by their hospital. They needed to keep subscribing to the Internet and online journals but this was expensive. The situation was similar to that outlined in the studies by Tan *et al.* (2006) and Ajuwon (2006) who indicated that doctors were dissatisfied with the accessibility of the Internet in their hospitals and that the cost of accessing the Internet and journal subscriptions hindered doctors' access to online resources. This is a concern because, as Ajuwon (2006, p.7) stated, "lack of access to the Internet in the office may undermine physicians' ready access to up-to-date information for patient care".

Although several studies in the literature review showed that the lack of IT skills and information overload were the most common problems indicated by doctors when they seek information from the Internet (Casebeer *et al.* 2002, Tan *et al.* 2006, Dorsch and Pifalo 1997, Ur Rehman and Ramzy 2004b, Doney, Barlow and West 2005, Bellman *et al.* 2005, Bennett *et al.* 2006), the participants in the focus groups and interviews revealed a different view, stating that they had good skills in using electronic IT

resources such as the Internet. They added that they rarely need help from professionals such as librarians or the computer support centre. However, if they did need help, they often called for assistance from their colleagues. Kudair and Cook (2008) indicated similar outcomes; that clinicians in a Saudi Arabian government hospital preferred to learn to use electronic resources and services with the assistance of friends or colleagues and by themselves. Also, Ocheibi and Buba (2003) found that doctors in a Nigerian hospital most frequently searched for literature by themselves. The reason for the lack of assistance from information professionals might be that Internet access by doctors frequently takes place in the home rather than in the hospitals, so families and friends are more accessible to them there. Another issue, as evidenced from the results and also the review of the literature, is that there is a lack of professional clinical librarians in almost all medical and hospital libraries in Kuwait. If the doctors had used the Internet where the persons are professionally trained and equipped with the necessary capabilities, their expectations might have been higher.

The questionnaire findings showed some contradictory outcomes; only 19.6% of the respondents indicated a lack of skills in searching, but more than half of the respondents said they needed training in the use of the Internet and information technology. This result raises three issues. First of all, most of the respondents received their higher education from Western universities and they had working experiences in the UK, the USA and Canadian hospitals, and might use ICT in their homes. Additionally, since the majority of Kuwaiti doctors had an undergraduate degree from the faculty of Health Sciences in Kuwait, probably most of them were taught to use ICTs resources. Reviewing the Health Science undergraduate programs in Kuwait University revealed that "Introduction to Computers in Medicine" is a compulsory module taught in the HS faculty. The course aims to provide the students with the following skills:

- "*Manage information on the computer in a systematic, hierarchically organized collection of units, such as files and folders;*

- *Develop and demonstrate competence in using applications such as word processing, spreadsheets and PowerPoint;*

- *Access and use the World Wide Web for professional purposes;*

- *Follow established guidelines regarding electronic communication using email;*

- *Select and use electronic resources and medical databases available in the network-based resources*" (Health Sciences Center 2009).

Second, the rapid advancement of ICT in the healthcare environment has encouraged doctors to cope with using these technologies. As indicated in the previous section, many studies indicate that doctors use online resources and the Internet heavily. Tan *et al.'s* (2006) study showed an increasing use of electronic resources of information by clinicians and all of them accessed several online resources such as databases and text books. The third issue is the possibility of a misconstruction of doctors to distinguish between having skills in using ICT sources and skills in searching health information. For instance, doctors may have good skills in accessing the Internet and utilizing a PDA as technology, however, when they search information they have fewer skills in using searching techniques, e.g. Boolean operators, to retrieve relevant titles. Thus, maybe doctors need more training in using techniques of advanced searching and to improve their skills in using ICT tools. The findings of Meats *et al.* (2007), whose study investigated clinicians' search behaviour in using the TRIP database - a meta-search engine, support this. The results of a Web log analysis indicated that few Boolean operators had been used by clinicians, most of the searches conducted by them used a single term and only 12% used a Boolean operator. Although clinicians in the

observation study show their curiosity in performing professional searches, they lack the skills to accomplish this.

The focus group results indicated that most participants used the Internet and online resources to keep up-to-date with current issues in their speciality and also sometimes to obtain information about new diseases and medication. The questionnaire results and interviews both found that the Internet is used for several reasons, however, the majority of respondents in the questionnaire reported that they used the Internet for personal use e.g. email, followed by keeping up-to-date. More than half of the respondents said they used the Internet for improving clinical decision-making. The findings are similar to a certain extent to those from the study by Casebeer *et al.* (2002), which indicated a high use of the Internet for personal use and searching literature rather than for patient healthcare purposes. The findings of Ajuwon (2006) supported that and indicated that when doctors were asked about the reason for accessing the Internet last time, 62.2% of them reported for email and only 5.2% indicated for patient care. Although the study conducted by Khudair and Cook (2008) showed that most participants (physicians, nurses, medical technicians, paramedical personnel and pharmacists) reported a need for information in order to keep up-to-date, the respondents' job description was found to be significantly associated with their information needs. They found that clinical care and keeping up-to-date was a greater need for nurses than doctors, while the need for information for education and research was greater for doctors than nurses.

In addition, the interviewees added the other reason that they sometimes searched for information was to present cases in meetings and discussions with their colleagues. An interesting finding from this current study was that more than half of the respondents to the questionnaire obtained information from the Internet to answer their colleagues'

questions and also patients' questions. It seems that interpersonal communication is an important motivating factor encouraging the doctors to obtain information from the Internet. The interviewees clarified this by explaining that sometimes patients brought Internet printouts for new medications and treatment procedures to consultations. There is evidence in the literature indicating that physicians are increasingly experiencing patients bringing Internet printouts to a consultation (Van Rijen, De Lint and Ottes 2000, Wolffenbuttel and Van Woerkum 2000 and Van Woerkum 2003). Possibly, patients want to be involved in doctors' decision-making and share opinions about their treatment plan and procedures. Thus, doctors need to be ready to cope with different expectations of information needs and seeking. Van Woerkum (2003, p.1018S) said that

"It is now time for physicians to consider alternative strategies in coping with Internet-savvy patients, especially regarding the inequalities among patients associated with the use of the Internet. In time, this will change how physicians approach their practice and how the profession is defined".

Another issue investigated in this part of the study was the electronic resources sought by doctors. Participants in the focus groups and interviews indicated the resources most frequently obtained from the Internet were online databases such as MEDLINE, PubMed and OVID and NEJM. In addition, most of them indicated that they searched Google. The questionnaire results supported this and found that less than half of the respondents searched MEDLINE in the HSCL. The results are similar to those of Ajuwon (2006) who found Google to be the most commonly-used search engine, reported by two-thirds of the respondents. The literature also shows that MEDLINE and PubMed were the online resources used most frequently by doctors (Klein *et al.* (1994, Pyne *et al.* 1999, Owen and Fang 2003, Ur Rehman and Ramzy 2004a, Tan *et al.* 2006 and Ajuwon 2006). Conceivably, the decision of the National Library of Medicine to eliminate the

fees to use MEDLINE and make it free has caused an explosion of end-user searching (Smith, Herzka and Wenz 2004).

The interviewees and the focus group participants outlined some criteria they considered in choosing health information on the Internet. Participants in the focus groups mentioned that information should be clear, organised and accessible. Also they wanted up-to-date resources. The most important criterion stated by the interviewees was that the information should be peer-reviewed and evidence-based. Some of them added that they looked at information on websites and online resources that had been recommended by their colleagues. Most of the criteria were similar to previous studies that indicated the importance of accessibility (Verhoeven, Boerma and Jong 1995 and Dawes and Sampson 2003); reliability and evidence-based resources (McKnight *et al.* 2002, Gosling, Westbrook and Coiera 2003, Magrabi *et al.* 2004 and Zack *et al.* 2006) and recommendation from experienced and trusted sources such as colleagues (Perley 2006). The use of the telephone, personal mobile phones in particular, to obtain information was another notable feature of the study. Most of the participants in the focus groups and interviews indicated the necessity of using mobile phones to communicate with their colleagues because they facilitated quick consultations. Also, sometimes they shared cases and discussed new issues in their specialist area by phone. The questionnaire results supported this and showed that the majority of respondents (82.4%) communicated with their colleagues by mobile. The literature outlined some scenarios for the use of mobile phones between doctors for clinical decision-making. One example was Dr. David who texted his friend and colleague to help him with a surgical procedure he had never performed before for a sixteen year old boy who had injuries from an explosion and had been sent to Rutshuru hospital in the Congo. David said "I texted him and he texted back step by step instructions on how I do it". Some weeks later, the boy

was discharged from hospital and his condition was "as good as could be expected" (Bates 2008). Today, mobile information and communication technology devices are increasingly available and are utilised by doctors for several purposes, particularly for improving clinical decision-making and patient care. It is a key issue of debate in many studies (Ammenwerth *et al.* 2000, Fischer *et al.* 2003, and Bunn, Byrne and Kendall 2005).

The participants in this current study complained that the hospital did not provide them with mobile phones and so they often used their personal mobile, which had financial implications for them. The questionnaire supported this and showed that nearly all of the respondents did not have mobile or cell phones provided by their hospitals. In addition, around 60% indicated that a lack of information technology, such as a mobile and email, to communicate with their colleagues was a problem. One interviewee in Mubarak hospital argued that the hospital should provide him with an internal mobile, as with his colleagues in Al Amiri hospital. The interview results similarly supported this finding but showed that Al Amiri hospital provided its doctors with internal mobiles and a paging system to help communications between doctors anywhere in the hospital, particularly in areas where there was no mobile coverage, such as at basement level.

Another interesting issue found in this study was that the interview results indicated that a few participants obtained information from medical programmes by watching T.V. and listening to radio stations. They mentioned that the media provided them with good information about handling emergency cases but stressed that information should be evidence-based. These results are similar to those from an early study by Marshal and Alexander (1977) who pointed out that radio and television are good sources of

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information when used in combination with other sources, such as group discussion or printed materials.

8.2.1.2.4 Personal and departmental collections

The majority of respondents had a personal collection from which they frequently obtained clinical information. This is confirmed by some studies in the literature indicating doctors' heavy reliance on their personal collection for meeting information needs (Dorsch 2000, Bryant 2004 and Tenopir *et al*. 2007). The interview results showed that electronic resources available via PDAs and laptops were the most common personal Information Communication devices used by doctors. Doctors interviewed also indicated that they had pocket books. Most of them subscribed to online journals such as NEJM, EMJ and the Lancet and they also accessed departmental guidelines and PowerPoint handouts from seminars and workshops through these devices. A very small number of participants indicated that they subscribed to printed journals. This is possibly related to the nature of the doctor's specialism, as they have to use online journals extensively to keep them up-to-date with the new issues that arise in their speciality. The results contradict studies that found that printed resources, such as textbooks and references, were the most common type of resources in doctors' personal collections (Bryant 2004). However, it reflects Romas, Linscheid and Schafers' (2003) study, which found that the large number of resident doctors answered their clinical questions by using a pocket reference (handheld computer).

Generally, all interviewees emphasized the importance of using their personal collection and they preferred it for a number of reasons. Firstly, they reported that their personal collection satisfied their information needs, such as help in practising their profession,

keeping them up-to-date with new developments in their specialty, improving their clinical decision-making, helping in managing patients and providing support for giving lectures and seminars. Almost all the previous studies reviewed showed that the most common reasons for the use of personal collections by doctors were improving patient care, improving clinical decision-making and keeping up-to-date (Ely *et al.* 1999, Dorsch 2000, Bryand 2004, *Ely et al.* 2005 and Tenopir *et al.* 2007).

Secondly, the doctors interviewed said that their personal collections gave them independence and the capability for better and more effective time management. The interviewees indicated that the accessibility of their personal collections held on devices such as Personal Digital Assistants (PDAs), laptops and pocket books helped some of them in their communication with patients. There is also evidence from the literature that the use of PDAs and handheld computers impacts on clinical decision-making, patient education and teaching medical students (McAlearney, Schweikhart and Medow 2004, Baumgart 2005 and Ranson *et al.* 2007). This also supported the previous findings of Garvin, Otto and McRae's (2003) study, which indicated that the majority of residents obtained information from their hand-held computers. Also, O'Sullivan *et al.* (2007) emphasised that the new trend of utilizing the PDAs to record and access patient information enhanced doctors' clinical decision-making through accessing real-time and accurate patient data.

Thirdly, interviewees indicated that their personal collections are a quick reference and they can use them in any place and whenever they want them. They are therefore a good source to refer to for emergency cases. The reasons for preferring their personal collections perhaps relate to the types and characteristics of the sources used. It was obvious that doctors prefer to use mobile and portable resources such as PDAs, laptops

and pocket books. The results in McKnight (2002) indicated that doctors often emphasised that their preferred source format should be online or on a handheld device. Although Tan *et al.* (2006) found a small number of clinicians using portable devices to store and access the information they needed, some of them stressed the importance of using portable devices as a means of making the information more accessible to them and enabling them to use online resources more frequently.

In the current study, a relationship was found between the type of resources in the personal collections and where the personal collections were kept and organised. Most of the interviewees kept their print resources in their home, because most of them did not have cabinets in which to file them in the hospital. Thus, they rarely used their printed resources inside the hospital and mostly used them in their home. On the other hand, the advantages of the accessibility and mobility of the electronic resources gave more flexibility so that doctors could use them in any place they wanted to. Most of the interviewees used their laptop and PDAs inside the hospital. Some of them said they used them in front of the patient. In contrast, some interviewees argued against using their personal collection in front of their patients, thinking that opening a book in front of a patient undermines the doctor's character in the eyes of the patient, which may negatively influence the treatment. The interviewees indicated that they organised their electronic personal resources through folders and files on their PDAs and laptop. They updated their collection by keeping online subscriptions, purchasing new books, attending conferences and accessing the Internet. Also, some of them mentioned asking colleagues. The most common sources of current awareness used by doctors in Ocheibi and Buba (2003) were publishers' catalogues and "invisible college" (24.7%).

The departmental collection was another type of information source which respondents in the four hospitals indicated that they used. However, use of information from departmental collections was less frequent than that of other resources such as personal collections. A small number of focus group participants indicated that sometimes they obtained information from departmental collections for improving their clinical decision-making and presenting cases. The interviewees confirmed they had not often obtained information for these reasons. Participants in the focus groups and interviews mentioned that some doctors had voluntarily developed a small collection of resources including books, journals and CDs, they were usually located in the ward areas where there were offices. They indicated that the resources were very old and there was no specific person responsible for updating the collection. Also, some of them indicated that these were often temporary collections, for example, they had a free online subscription to some websites offered by private companies for a trial period only.

8.2.1.2.5 Interpersonal communication

The results of the study showed the different features of interpersonal communication, which enabled doctors to obtain and share the information they needed.

Communication with patient

Doctors communicating with patients or patients' parents/relatives/maids was the most common form of interpersonal communication, enabling doctors to obtain the necessary patient data, such as patient history data. Most of the participants in the focus groups and interviews were dissatisfied with their communications with their patients. However, the questionnaire results showed that a very small number of the respondents reported

dissatisfaction with communication with the patient and more than half were neutral. The participants in the focus groups and interviews reported some difficulties in gathering the patient history data from the patients. The most common problem they encountered was a language barrier with patients who could not speak Arabic or English. The questionnaire results supported that half of the respondents reported language barriers with patients and patients' parents/relatives. A critical issue that emerged was that doctors revealed they sometimes used nurses or porters from the same country as the patient to act as an intermediary to translate the language. Another feature of obtaining information from an unauthorised intermediary was when elderly patients and children came in with maids who lacked awareness of the patient's condition and medical history. There is a risk that the intermediary interpreter will transmit inaccurate and incomplete patient information to the doctor. There is evidence in the literature showing the role of health interpreters in establishing a communication channel with the doctors to help in translating patient information. Although, the medical interpreter acts as a neutral party, they often actively interfere with the content of the conversation and he/she decides what is said and heard (Hsieh 2003, Bolden 2000, Brashers, Goldsmith and Hsieh 2002). Bolden (2000) investigated the role of medical interpreters in structuring interactions between physicians and their patients. The role of the medical interpreter was to obtain the history of the patient and translate this for the doctor. The results demonstrated that interpreters edited information that they thought and believed to be diagnostically appropriate without any explicit explanation. Another problem also created by utilising the intermediary in doctor-patient communication was that it may negatively reflect on the patient's opinion when evaluating the services provided by the healthcare institutions (Kaufert, Putsch and Lavallee (1999). Another issue is that the patient may be sensitive about the doctor providing the interpreter with his/her diagnosis, particularly if they are of different genders.

A critical problem stated by interviews and focus group participants was that a lack of patient awareness of some medical terms, early symptoms and general medical information issues caused conflict between the doctors and patient in discussing diagnoses or treatment plans. The questionnaire results confirmed this with more than half of the respondents reporting this problem. The interviewees clarified the issues, indicating that sometimes they needed the patient to be a part of their clinical judgment regarding choice between different options of drugs and treatment plans. They also said there was a shortage of public health media for the dissemination of health information to the public and no seminars or group discussions were provided by the hospitals or the MOH encouraging the patient and his/her family to come to the hospital, share his/her condition and improve awareness of the current health issues related to his/her condition. Patient involvement and shared decision-making regarding their treatment plan, investigations and drug choice are a crucial issue in the ideal model of treatment decision-making in the medical encounter (Deber 1994, Charles, Gafni and Whelan 1999, O'Donnell *et al.* 2006, and Whitney *et al.* 2008). There are some promising examples in the USA, Canada, the UK and other European countries in involving the patient in improving healthcare services and patient satisfaction (Härter *et al.* 2009). For example, the UK government has legislation in place supporting, patient and public involvement towards improving healthcare services in the NHS (Department of Health 2008). Whitney *et al.* (2008, p.703) noted that in situations where there are two or more treatment choices, doctors should encourage the patient to share his/her decision if he/she wished. However, if there is only one choice of treatment, the clinical decision-making should be a process of negotiation between the patient and doctors to reach agreement between them. They stated:

"Optimal decision-making results from expert identification of the medically reasonable alternatives and determination of the presence or absence of uncertainty in the clinical situation, as well as thoughtful probing of the patient's preferences when they are relevant".

Thus, it seems that improving the current awareness of the patient about his/her condition will aid doctors' clinical decision-making.

A time constraint in dealing with patients was another problem indicated and stressed by participants in the focus groups and interviews. The questionnaire results similarly indicated that more than a quarter of respondents reported a lack of time to talk with patients. The interviewees mentioned that sometimes they needed to take a detailed history of new patients and undertake a physical examination. All these procedures take time to complete and also need to be documented in the patient's file. Time constraints often impeded them from obtaining all necessary patient information, however.

Sometimes patients or patients' parents/friends were not cooperative in providing doctors with the necessary patient history data. For example, some parents protect their children and resist doctors gathering their medical history. This scenario perhaps reflects the socio-cultural issues such as a family-centred culture (Rees and Bath 2000). There is evidence in the literature that in some family-centred cultures in China, Vietnam and Korea, information is controlled and the decision-making is often the responsibility of family member rather than the individual ((Kaufert, Putsch and Lavallee 1999, Muller and Desmond 1992 and Blackhall *et al.* 2001).

Also, some patients discussed their condition with unauthorized sources of information e.g. they share their case in social gathering places (Dewaniya) and this makes the

patient listen to inaccurate and false health information. They may then provide doctors with misleading symptoms and this will affect their communication with their doctors. One interviewee from Al Amiri pointed out:

"People tend to believe 'Dewaniya' more than doctors,
which is an unusual trend".

Brashers, Goldsmith and Hsieh (2002) pointed to information-seeking in the context of interpersonal communication. They stated that people may turn to social support to seek information to cope with life stresses, e.g. illness, by referring to members of their social circle such as friends and relatives. Social support is a normal activity in many societies, particularly Middle Eastern countries. This again raises the importance of the information barrier as a social-centred factor, but the critical issue is how doctors deal with these contextual factors to obtain the necessary and credible information and to provide the right clinical decision without being impeded by socio-cultural factors.

Patients missing appointments for further investigations was another barrier impeding doctors' information-gathering. The questionnaire results showed 35.6% of respondents reported patients missing appointments. The participants also argued that the delays in sending investigation results from the labs and X-ray department affected their clinical decision-making, particularly when they had limited time to see the patient. They added again that missing patient files, incomplete information and missing forms were barriers to information-seeking. They indicated that they sometimes had to repeat requests for lab tests for a patient, because the results were not placed in the file. The absence of this type of information will increase the uncertainty of doctors' clinical decision-making. There is evidence in the literature that doctors reduce their feelings of uncertainty in the clinical situation by ordering more diagnostic tests or prescribing several medications

(Gifford, Vickery and Millman 1995). Utilizing more resources will lead to higher costs. The literature showed that doctors who encounter and report stress from uncertainty, utilize more resources in the healthcare setting and lead to higher costs (Gerrity, DeVillis, and Earp 1990). On the other hand, doctors who were comfortable with uncertainty showed the opposite attitude (Gifford, Vickery and Millman 1995).

Communicating with colleagues

The findings of the study indicated that doctors considered communication with their colleagues inside the hospital to be important. For example, some interviewees in Al Amiri and Mubarak hospitals revealed that their consultant colleagues were an essential part of the departmental information resources.

The doctors in the focus groups noted how they often turn to their colleagues for several reasons, although three needs were reported most frequently: to discuss patient cases; to ask for a second opinion and to share opinions. The interview results supported that and also showed that doctors relied on colleagues when they lacked knowledge in new cases and diseases and were prepared to consult those with other specialties. This finding supports the results of previous studies, which have similarly found that communication with colleagues is a valuable source of information for doctors (Smith 1996, Haug 1997, Romas, Linscheid and Schafers 2003, Tan *et al.* 2006 and Coumou and Meijman 2006). It was clear from the literature that doctors frequently rely on their colleagues for information and most of the reasons for this indicated in the literature are similar to those found by the present study. Gorman (1995) revealed the heavy reliance on human resources by doctors when they lacked knowledge and to solve clinical problems. Bennett *et al.* (2006) and Tan *et al.* (2006) similarly found that doctors refer to their

colleagues when unsure about diagnostic and management issues for unfamiliar or complex cases.

In addition, there were some other factors motivating doctors to rely on their colleagues. The first factor was the pressure of time. The interviewees revealed that they prefer to obtain information from their colleagues when information was needed quickly. Another thing pointed out by the interviewees was that their colleagues were accessible and worked around them. Thus, it is easy to communicate with them when they needed advice. This factor was supported by the early study of Covell, Uman and Manning (1985) who found that convenience of access is an essential factor influencing doctors' information-seeking behaviour. An additional fact is that they like to turn to reliable and experienced sources. Some interviewees said that they asked colleagues to share their experience and that this was the source they most trusted. Most of the factors indicated by doctors that stimulated them to communicate with colleagues, i.e. reliability and expert opinion, accessibility, timeliness and urgency, were similar to the findings of many previous studies (Manian and Janssen 1996, Keating, Zaslavsky and Ayanian 1998 and Perley 2006).

The results of the study indicated that there is a statistically significant relationship between respondents' working experiences and the reasons for communicating with colleagues. It was found that the less-experienced doctors communicated with their colleagues who had more years of experience for the following reasons: to discuss other patient cases; to ask for a second opinion; to share knowledge and to consult on admitting or discharging patients. On the other hand, doctors who had more years of experience were more likely to provide second opinions. The questionnaire result showed that respondents liked to communicate with their colleagues in different ways.

However, nearly all of them favoured communicating with their colleagues face-to-face and also by using mobile phones. Although the results in section 8.2.1.2.3 indicated that the most common reason for using the Internet was personal use, such as email, the results here showed that few of the respondents (11.5%) communicated with their colleagues by email. Possibly, doctors were communicating with their colleagues from a long distance. However, face-to-face and by mobile phone were the most common communication modes inside the hospitals.

It was found that doctors not only communicate with their colleagues within the hospital but their communication was extended to communicate with colleagues outside their hospital. However, the reason for communication was often focused on managerial issues regarding patients, for instance, a shortage of beds. Also, they sometimes called other hospitals for reasons such as urgent consultations and to obtain information and/or to discuss specialities not available in their hospital.

The results showed that 52.8% of respondents reported dissatisfaction with their communication with colleagues in other hospitals. The interviewees stated that the lack of information technology (mobile phones, email and direct line contact number) were the main obstacles and difficulties when communicating with outside colleagues. Most of them were also dissatisfied with services provided by telephone operators in the other hospital. They added that sometimes the other hospitals send patients with inaccurate and incomplete clinical and history information in their records.

It is interesting to note that doctors obtain information from other professionals such as ambulance staff. Some doctors indicated that they sometimes obtained information from ambulance staff, particularly in the emergency room, such as the clinical picture when

they first saw the patient, the urgent care procedures they undertook for the case and also the drugs and medication they may have given to the case and the history of the patient if they obtained it from the patients' relatives or witnesses. They reported that this information helped in managing the patient and improving their clinical decision-making. There was no relevant literature found to compare with the results of this part of the study. Nevertheless, it can be concluded that patient data can be obtained sometimes from ambulance staff.

8.2.1.2.6 Meetings, workshops and conferences

The results also showed another type of human information exchange through the attendance at different types of meetings in the hospitals: daily, weekly and monthly. These were regular meetings and required by their job descriptions. Besides these, there were other meetings attended by doctors, primarily for improving their professional development. More than half of the respondents reported that journal clubs and attending conferences were useful sources of information. Also, more than a quarter of the respondents reported that they attended other meetings and workshops inside and outside their hospitals e.g. workshops given by other departments in their hospital (Radiology workshops, Anaesthesia workshops, nutrition and obesity workshops) all of which provided them with information. However, it was significant to find a few of the respondents indicating that they attended ICT workshops and courses.

The results indicated an interesting issue of the relationship between the attendance at some meetings and seminars and the organization the doctors worked for. It was found that Mubarak hospital participants were more likely to attend daily meetings and seminars. This perhaps reflects the organisational setting as Mubarak is a teaching-based

hospital, thus, normally there are more seminars and lectures run in the hospital for teaching purposes. On the other hand, Al Amiri participants are more likely to attend weekly and monthly seminars and journal clubs inside the hospital. But participants in Al Sabah hospital were more likely to attend conferences and other seminars and meetings outside the hospital. It seems that there is encouragement for sharing information and knowledge inside Al Amiri hospital. However, in Al Sabah hospital, participants were encouraged to share knowledge and information outside their organisation.

Doctors outlined the benefits of attending the different types of meetings for improving their knowledge, keeping up-to-date with new medical information and enhancing their clinical decision-making. Most interviewees focused on journal clubs. They mentioned that these gave them the opportunity to engage in group discussions on current and recent topics in their specialty and they helped to keep them up-to-date, particularly as they were usually busy and had some difficulty coping with the explosion in health information. Although the results showed the value of obtaining information from professional meetings, seminars and workshops, few previous studies have investigated how the information needs of doctors are met by attending meetings and workshops (Nylenna and Aasland 2000 and Bigdeli 2004). According to evidence from Bennett *et al.* (2004) the attendances at local CME courses and the use of journals has been declining (2001-2003) and utilising electronic resources has increased. In 2001, 31.0% of doctors reported accessing the Internet for CME courses and the access was increased in 2003 to 45.5%.

There were some problems encountered by participants in attending meetings, seminars and conferences. Time constraints were a barrier for some interviewees preventing them

attending seminars and conferences in other hospitals and organizations. Some interviewees were dissatisfied with the quality of information and topics presented in the seminars. They indicated that the information was often outdated and unorganized. This suggests that doctors need more training in obtaining relevant and quality information to present in such meetings. Also, clinical librarians need to be a part of the meetings, particularly journal clubs. There is evidence in the literature indicating the role of clinical librarians and informationists in helping and facilitating doctors' information-seeking. (Booth, Sutton and Falzon 2002, Freeth and Smith 2003, Lappa 2005, Brookman *et al.* 2006). Urquhart *et al.* (2007, p.14) concluded their study by stating that:

"Collaboration with a clinical librarian increased clinician willingness to seek information.
Clinical librarian services should leverage structured training opportunities such as journal clubs".

8.2.1.2.7 Sources of drug information

There were two main sources of obtaining drug information indicated by the doctors: personal drug literature and asking pharmacists. Interviewees indicated that drug literature is one type of resource held in personal collections and that drug literature is available in two versions: electronic and printed. Doctors mentioned different types of personal drug resources such as BNF, Kuwait drug references, Martindale eBooks, and other sources from online websites (e.g. www.kuwaitpharmacy.com and www.rxlist.com), medical schools and private companies and conferences. Some previous studies found that drug literature is one of the most frequently sought information resources by doctors (Fly, Bruch and Vinson 1992, Gorman 2001 and Msv *et al.* 2008). The results showed also that doctors obtained drug information from

pharmacists. Most interviewees indicated two main types of information sought from pharmacists: the availability and dosage of medication. Some of them also turned to pharmacists when looking for information about the side effects of using some drugs and some also said they obtained information from a pharmacist to teach their students. The findings corroborate those of the study conducted in Kuwait Government hospitals by Matowe *et al.* (2006) who indicated that doctors' main reasons for communication with pharmacists were asking about drug availability (79%), alternatives (54%), side effects (25%) and drug interactions (18%).

The above discussion indicated the different sources of information sought by doctors for their medical practice. The next section exhibits the seeking of those information sources when doctors communicate with patients face-to-face for clinical decision-making in different scenarios.

8.2.2 Information-seeking: scenario-oriented approach

Generally, doctors make their medical judgment when they meet their patient in different scenarios; however, the most frequently mentioned scenarios indicated by doctors in the focus groups were outpatient departments, emergency rooms and wards. The participants pointed to the importance of the availability of information sources to support their clinical decision-making and to enhance patient care. Elson, Faughnan and Connelly (1997, p.266) stated that "clinical decision-making is driven by information in the form of patient data and clinical knowledge". The results of the focus groups suggested that, to assist their medical practice, doctors seek information from a wide range of sources. The extent to which the different sources were used in the three

different clinical scenarios (outpatients, wards and emergency room) was explored further through the questionnaire. The respondents were thus asked to indicate the degree of their use of different sources of information. These sources of information have been divided into three main categories: Doctors' knowledge and experience; patient data; and knowledge support resources. These were defined in chapter five as:

- *Doctors' knowledge and experiences:* knowledge accumulated from their education, their experience and also the knowledge that comes from updating their information by reading, research and attending seminars, workshops, conferences and meetings.

- *Patient data*: includes all types of information that contributes to patient data history (patient medical file, HCIS, test/investigation, communication with patient, patients' parents/relatives/friends/maids, patient data extracted from ambulance staff and nurses).

- *Knowledge support resources*: consists of library resources, the Internet, personal collections, departmental collections, asking colleagues, asking pharmacists, drug literature and calling other hospitals for consultation in a specialty which does not exist in the hospital.

The focus group participants and interviewees indicated that when they communicate with patients the primary source of obtaining information to help them in their clinical decision-making is the patient's own knowledge and experiences. This supports the findings of previous studies. Wyatt (1991) and Thompson's' (1997) study similarly indicated that medical knowledge is the information source doctors often relied on. In addition, this knowledge can be enhanced with key information, such as patient data. For example, one participant in this current study said:

"I usually refer to my knowledge, ... but patient care depends on how the patient can describe his/her symptoms ....it usually helps in an estimated 80 to 90% of the

diagnoses, and the investigations .....can either make those findings correct or rule them out".

The results indicated that the most frequently used patient data in the three scenarios was communication with the patient and reading the patient medical files. Also, communication with patients' parents and relatives and requesting tests and investigations were also indicated by a large number of the respondents in the three scenarios. As evidenced in the literature review, there is a lack of studies to support this section. However, the early study by Osheroff *et al.* (1991) pointed out that when doctors need information for patient care half of the information could be obtained from the patient's medical file.

A critical issue which emerged from the findings, however, was that not all 541 of the respondents used patients' files in the three clinical situations. Interviewees indicated that they used patient files less in the emergency room because sometimes they received new patients from other health regions who came without files or they received walk-in patients who needed temporary treatment. In addition, they faced the problem that sometimes they saw patients in the outpatients and on the wards without files because of reasons such as missing files or delays in sending the patient's file from the medical records department. This result was also supported by the findings explained in section 8.2.1.2.1 discussing the barriers hindering doctors in using patient medical files.

Some respondents reported never gathering information from ambulance staff in outpatients and on the wards but many respondents reported they did sometimes gather information from ambulance staff in the emergency room. That is simply because the ambulance staff are available and provide services to the emergency room. In addition,

the Healthcare Information System was not indicated as a source used by many respondents. For example, 112 (36.5%) of the respondents indicated that they sometimes used it in outpatients. Also, 150 (41.8%) of the respondents said that they did so sometimes in the wards and 81 (29.7%) used it sometimes in the emergency room. This supports the evidence presented in section 8.2.1.2.1, which discussed interviewees' use of the Healthcare Information System. It emerged that use was more extensive in some of the hospitals than in others, for the reason that the system is still undergoing development. Thus, the use of paper patient medical records is currently the main source for patient data and possibly the degree of using the HCIS will change when the system is completed and implemented in all departments and areas of Kuwait government hospitals.

The questionnaire results and interview findings indicated that knowledge-support resources were less heavily used than doctors' knowledge and patient data in any of the three situations. The results of the questionnaire confirmed that and showed the use of knowledge resources was less than the patient data resources. However, personal collections and asking colleagues were the sources used most frequently in all three clinical areas. The findings of Coumou and Meijman (2006) support this, pointing out that doctors refer first to their colleagues when they need answers to their clinical questions. In addition, it is obvious in section 8.2.1.2.4 that a personal collection was the most frequently reported source of information utilised by doctors inside the hospital and sometimes they used it in patient encounters through the use of devices such as the use of PDAs. This result corroborates the findings of Lu *et al.* (2003) who found the frequent use of PDAs by doctors in their routine work to obtain drug information from ePocrates.

Although the doctors highlighted the importance of the Internet in their medical practice and reported that they frequently used the Internet to fulfil their information needs, the Internet was not used very extensively in any of the three clinical areas. The use of the Internet was highest on the wards where around half of the respondents (46.5%) indicated that they used it sometimes. Less than half of the respondents used it in outpatients and the emergency department. These findings conflict with the study conducted by Bennett *et al.* (2006), which found that only 9% of doctors reported accessing the Internet for information during patient encounters. Most of the respondents in the current study never used library resources in any of the three situations. Very few indicated that they frequently used library resources in the three situations, the highest use being on the wards (28.5%).

8.3 Doctors' suggestions for improvement

One of the objectives of this current study was to gather the participants' ideas and suggestions to improve the current health information resources and services in Kuwait government hospitals. The participants made a number of suggestions for developing the health information provision system in the hospitals, which are outlined under the following categories:

Effective communication

It was evident from the results that communication is centrally important to doctors. The participants provided a variety of suggestions for improving the different features of communication. Firstly, participants in the focus groups and interviews advocated improving communication with patients through health education. The questionnaire

results also supported this with the majority of respondents advocating better health education for patients. The interviewees pointed out that patients need to be aware that providing medical history information is crucial to help doctors in their clinical decision-making. Also interviewees said that patients needed a better awareness in recognising general symptoms such as diabetes, breast cancer and obesity. The interviewees also suggested that patients needed to be aware that obtaining information from unauthorised people and sources might affect his/her diagnosis negatively.

It was suggested that better health information could be achieved through providing booklets, leaflets, pamphlets, handbills and posters in hospitals and public areas; giving seminars and lectures in hospitals and schools; providing commercials and advertisements on T.V. and radio; developing the healthcare website of the Kuwait Ministry of Health; providing email subscription to free medical advice; and providing free general health information through newspapers. In addition, to facilitate communication with patients, doctors suggested they needed sufficient time to see the patient, take the necessary patient data and undertake necessary medical investigations. Better time-management could be facilitated by hospital managers providing circulars in outpatients to outline the limits on the number of patients to be seen. Also, doctors wanted their hospital manager and heads of department to adhere more closely to regulations and avoid the problem of 'fast tracking' VIP patients who come without appointments. Also, they emphasised the importance of solving the problem of the language barrier and avoiding the risk of using unauthorised people such as maids and porters to translate patient history information. They suggested that this could be achieved through providing clinical translators from the Ministry of Health. Also, they suggested distributing leaflets about drug instructions or treatment plans in the hospitals in different common languages. They also highlighted the need for better cooperation

from patients and patients' family members in providing the information they needed, which, they stressed, was key to improving information provision in the hospital.

According to the doctors, communication would also be enhanced through better communication with their colleagues inside and outside the hospitals. They outlined some solutions including the provision of ICT sources such as internal mobiles, paging systems and emails. Also, the participants wanted to improve their communication with other doctors and healthcare providers outside Kuwait, such as in Western countries, Eastern countries and the USA. The questionnaire results supported this and indicated that 84.6% of the respondents wanted better communication with other international hospitals and healthcare centres. They proposed that their hospitals should provide ICT resources to facilitate local and international communication through the use of emails, fax, telephone and the Internet. In addition, they suggested sharing patient data between hospitals in Kuwait through linking the Healthcare Information System by LAN and WAN connections.

Utilise ICT resources

It was evident from the results that doctors used different kinds of ICT resources such as laptops and PDAs, however, all these resources were personal property. Thus, it was not unexpected to find that doctors in the focus groups and interviews suggested that hospitals should provide Internet access points where they worked. Also, they suggested having online databases for the most common medical journals. They added that it was necessary to develop a proper infrastructure for a digital health information system. The HCIS needed to be upgraded and expanded to provide several information options such as more images and the provision of X-ray results. A recovery backup system should be

implemented to support the system. The questionnaire results supported those suggestions with 73.7% of the respondents suggesting the digitization of all information sources, such as patient medical files and the library. For example, some doctors shared their previous experience when they were studying or working with different systems outside Kuwait. They described the systems as impressive. They could access the Internet 24 hours a day, the systems were enriched with a range of online resources and also they could access electronic patient data freely and at any time they needed it. Lorenzi *et al.* (2009, p.6) outlined systematic steps in implementing EHRs in ambulatory care:

- Decision. In this step, the emphasis is on identifying champions (e.g. physician champion experience) to provide direction and encouragement for the project, collecting information, assessing workflows, understanding financial issues and analyzing benefits.

- Selection: This step focuses on determining whether to shift to an electronic health record system and which system to choose, a process that can be very demanding.

- Pre-implementation. This includes communicating and involving staff and patients; redesigning workflows; establishing a project plan; timely training and training that meets the needs of medical practice; and having fun as a means of encouraging the introduction of the system.

- Implementation. This includes engaging the patient through informing those who frequently visit about the value of EHRs; making changes and managing change; implementing rapidly and supporting extensively; and encouraging the practice

- Post-implementation. It focuses on continuous updating, training, evaluation, and again, celebration through sharing information from staff and patients.

Provide hospital libraries

More than half of the respondents in the questionnaire suggested the provision of a hospital library to improve information services in their hospitals. Participants in the focus groups and interviews proposed that the library should have online resources such as databases, journals and books. In addition, participants who had libraries in their hospitals recommended improving and updating the collections. This could be achieved by supplying the library with online databases and electronic resources. One participant told of his experiences working in Canada. He had been impressed with the size of the library, which had been equipped with high-quality electronic resources and staff and located close to the wards, which had been useful.

Training and orientation

Some of the interviewees suggested that hospitals should provide them with computer courses. They indicated that they were rarely invited to undertake this type of training. Also, some participants in Al Farwania wanted training in using the HCIS. The results were consistent with those of the questionnaire, which demonstrated more than half of the respondents suggesting the need for professional training in using ICT resources.

Provide qualified staff and improve the skills of staff

Many respondents suggested providing highly-qualified staff in the medical records department and hospital library. Participants in the focus groups and interviews provided suggestions of how to improve the skills of the current staff in the medical records department by providing more training courses and seminars about how to provide necessary and timely information to healthcare providers. They indicated that the employees in the medical record department should improve their skill in tracking charts and checking the availability of forms and the information in patient files before sending them to the doctors. Another suggestion provided was to employ professional people in the library, such as a medical librarian. In addition, they suggested encouraging other healthcare providers (nurses, laboratory technicians and ambulance staff) to attend their meetings and exchange and share opinions with them. This would help improve the awareness and understanding by other professionals of doctors' information needs.

Improve services provided by other departments

The interviewees also provided some suggestions as to how the services provided by departments in the hospital, including the medical records department, labs and X-ray department, could be improved. They suggested updating some forms in the patient medical files such as the discharge, summary reports and investigations forms. They pointed to incomplete information items on these forms. Probably the ideal suggestion for this problem is the involvement of doctors in the Medical Record Committee which usually holds monthly meetings and through which they could share their opinions of how to improve the quality of medical records. Moreover, they suggested finding a practical procedure to ensure that results from the laboratory and other investigation

departments are sent out in good time. They indicated that investigation results are usually sent with porters who often take long breaks. Indeed, were the HCIS to be implemented effectively this would absolutely reduce the time taken to send patient results and investigations to doctors.

Motivation for information provision

Some participants in the focus groups suggested stimulating the motivation of doctors to share and provide information by using some reward techniques such as words of thanks. Also, encouraging doctors to follow their patient and improve their knowledge by reading could be achieved through the provision a rich electronic-information environment.

Enhance the exchange of information

Participants also suggested providing more courses, seminars, workshops and conferences in the hospitals. They highlighted the importance of having more meetings, courses and conferences in their own and other specialties. They provided some examples of the workshops needed: ACLS (Advanced Cardiac Life Support) and ATLS (Advanced Trauma Life Support). Another suggestion was to improve information provision by providing CDs, DVDs and printed materials of conferences, seminars and lectures they attended or those attended by their colleagues. Also, the provision of statistical information for aiding research and studies was advocated.

8.4 Information-seeking models

The final objective of this research was to produce conceptual models to describe and explore the main elements of doctors' information-seeking in Kuwait government hospitals and to compare this with other previous conceptual models presented in the literature. Two conceptual models arose from the study findings.

8.4.1 Scenario clinical decision-making model

The first conceptual model was developed to show the information-seeking behaviour of doctors in the three clinical scenarios. An overview of the degree of use of information sources by doctors in the three scenarios (outpatients, wards and emergency department) is given in chapter six (see page 236) which, presents specific information sources for patient data and the knowledge resources indicated most frequently in the literature review. It also identifies the sources that were used in the three clinical areas in the four hospitals studied. The model consists of eight main elements, as shown in Figure 8.2: socio-cultural norms; the organizational context; the scenario context; doctors' knowledge and experiences; knowledge resources; patient data; clinical decision-making and the interdependent relationship element.
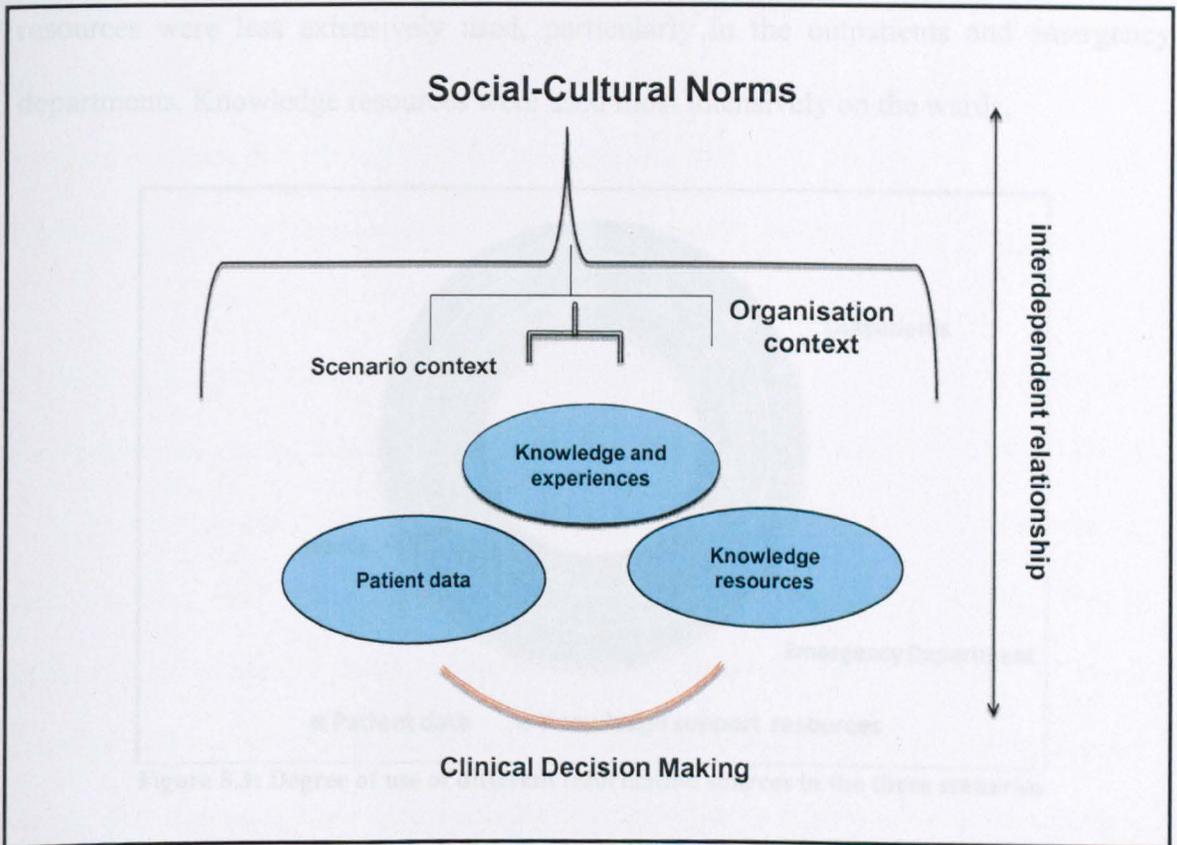
Figure 8.2: Scenario clinical decision-making model

Generally, the doctors' clinical decision-making occurs in different situations. Indeed, the clinical decision-making is driven by information which comes from three domains: the doctors' knowledge and experience, patient data and knowledge-support resources. This reflects the domains in Bauchiner, Simpson and Chessare's (2001) model. However, Elson, Faughnan and Connelly (1997) pointed out that clinical decision-making is driven by information from patient data and clinical knowledge resources.

The results of the questionnaire in this study indicated the degree to which the necessary information doctors obtain from these three domains: doctors' knowledge and experience, patient data and knowledge-support resources, differs from one situation to another. Figure 8.3 demonstrated the heavy reliance on patient data in all three scenarios: outpatients, wards and the emergency department. In contrast, knowledge

resources were less extensively used, particularly in the outpatients and emergency

departments. Knowledge resources were used most intensively on the wards.
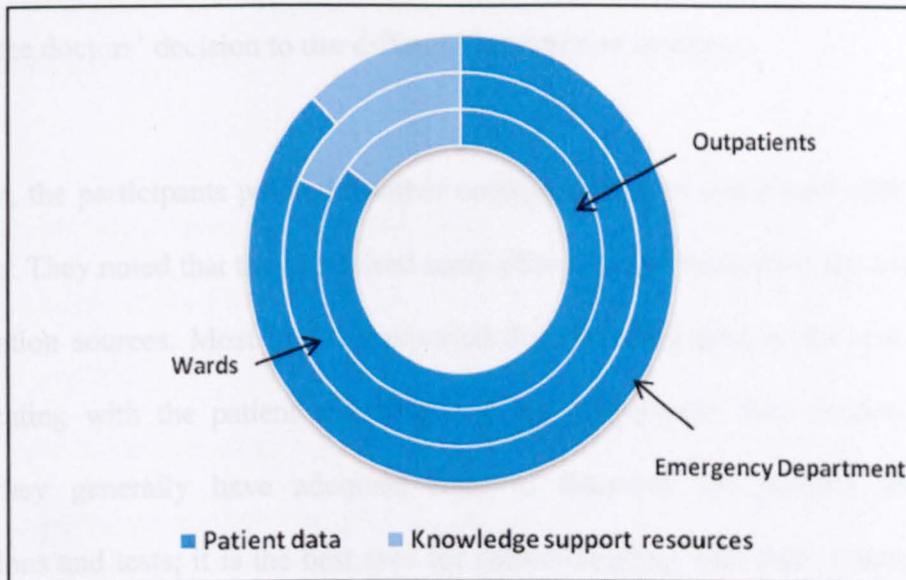
Figure 8.3: Degree of use of different information sources in the three scenarios

This is because the use of the sources in the domains is affected by a range of contextual

factors (see Figure 8.2). The contextual factors investigated in this study were, first, the

scenarios where doctors communicate with patients for clinical decision-making, such as

outpatient departments, wards and the emergency department. For instance, the

participants in the focus groups showed two types of patient-communication in the

outpatient scenario: new patients or old patients. A new patient is one who is coming for

the first time to hospital and is referred from primary care centres or another hospital or

the emergency department. In this case, the doctors will go more thoroughly through

her/his history and undertake a full medical examination and investigation. However, an

old patient is a regular patient who is coming for a follow-up, unless he/she indicates

new symptoms. Certainly, the type of information sought will be different from that used

in the urgent patient scenario in the emergency department. Doctors indicated that

sometimes they received unconscious patients coming in with a witness or next of kin.

In this scenario, the doctors will rely on the person who comes in with the patient to

obtain the necessary patient history information. Another scenario is when they receive a patient who needs immediate urgent surgery. In this case, investigations and tests will be the ideal evidence for clinical decision-making. Accordingly, the type of scenario will dominate the doctors' decision to use different information sources.

In addition, the participants pointed to other contextual factors associated with the type of scenario. They noted that they preferred some clinical areas because of the availability of information sources. Most of them reported that the ward area is the best area for communicating with the patient and obtaining the information they needed. This is because they generally have adequate time to diagnose the patients and order investigations and tests; it is the best area for communicating with their colleagues and sharing and discussing their cases; and they can easily access knowledge resources such as the Internet and the electronic resources available in their personal collections. On the other hand, they said that outpatients and emergency rooms were crowded areas and they did not have enough time to communicate with the patients and obtain the information they needed. They stressed that time constraints were an important factor, explaining that they spent 10 minutes or less seeing patients in outpatients, and they usually saw 25 patients or more in the outpatients area (usually they see outpatients from 9:00am to 2:00pm), so there was not enough time for taking important patient data. Also, delays in sending lab tests and investigations from the laboratory and X-ray department were helpful. In addition, obtaining information is critical in the emergency room. They indicated that they need to make a clinical decision with limited information. The finding is consistent with the previous point of view of Kovacs and Croskerry (1999) who described the clinical decisions in an emergency environment as complicated and that doctors rely on limited information while faced with a huge number of challenging demands and disturbances. An interesting issue found was that the emergency

department was considered a stimulating area by one participant in which to explore new cases and improve his knowledge. He said:

"I found emergency a challenging place, with new admission cases.
When you consult a new patient there are chances to get some new information
regarding a disease".

The second contextual factor was organizational. It was found that doctor's information-seeking was influenced by the organization where they normally worked. As discussed in previous sections, the availability and accessibility of information sources and services varied from one hospital to another. For example, Al Amiri hospital provides most mobile resources e.g. internal mobiles and a paging system. Also there was more encouragement to share and exchange information within the organization such as through journal clubs. Thus, there is an opportunity for doctors to keep in touch with the current issues in their specialty through attending those meetings. Also, they are able to share expertise with their colleagues by means of a quick consultation using the ICT resources, which will help doctors in clinical decision-making. Other evidence reflecting the organizational context is the cooperation and motivation between doctors and other healthcare providers to provide information. For example, the participants in the Al Sabah hospital focus group indicated cooperation with nurses in the department for building and maintaining a collection of information resources in their department. Also, effective time-management when sending the lab results will enhance doctors' clinical decision-making.

Socio-cultural norms are a third contextual factor with influence in the domains. It was obvious from the findings of the study that language barriers and family-centred cultural and social support were factors that impacted on doctors' information-seeking. For

example, in situations where family-centred cultural factors are strong, the doctors may seek information from the family rather than the patient him/her self. Another feature is when doctors meet a patient who does not speak Arabic or English; the doctors will possibly turn to intermediaries, such as nurses, to obtain information. This could cause doctors to obtain inaccurate information, which affects their clinical decision-making.

As indicated in Bauchiner, Simpson and Chessare's (2001) model, the three domains of: doctors' experience and knowledge; patient characteristics and values; and external clinical evidence are not static and change according to the clinical decision being made in different clinical scenarios. For instance, in urgent or acute conditions, there is less participation from the patient or patient's family in the decision-making. So the patient characteristics domain is fairly small in this case. The results of this study demonstrated an interdependent relationship. It was evident from the results of the study and the literature that clinical decision-making is driven by information from different sources, indeed, the clinical decision-making will change according to the degree of use of the three domains. In addition, emphasises on the three domains changes accordance on the type of clinical decision being made. The contextual factors surround and dominate the three domains, which interact and control the clinical decision-making. For example, Figure 8.4 shows the situation in the emergency department. It was found that clinical decision-making there depended more on doctors' knowledge and patient data than knowledge resources. This is because obtaining information in this area is very critical and restricted by many contextual factors.
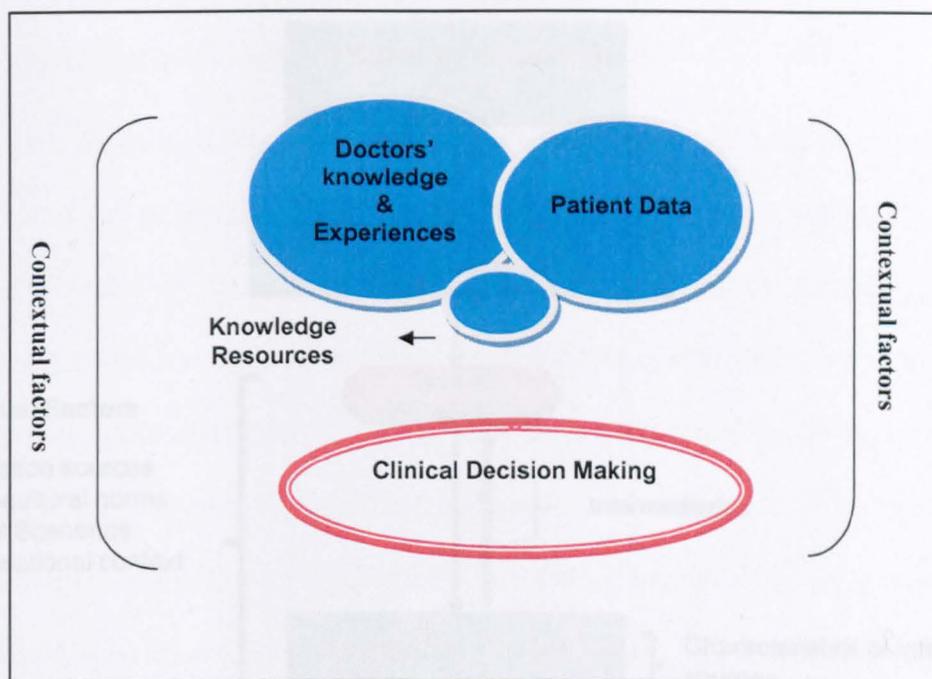
Figure 8.4: Emergency scenario

8.4.2 Overall conceptual model of information-seeking in KGH

The clinical decision-making model scenario (see Figure 8.3) provided a specific picture of information-seeking by doctors during patient encounters. However, exploring all of the results in the two contexts - source-oriented and scenario-oriented - enables us to draw an overall conceptual model of information-seeking in Kuwait government hospitals, as shown in Figure 8.5. The elements of the model were developed according to the results of the study. Some of these elements draw on previously developed models discussed in the literature review.
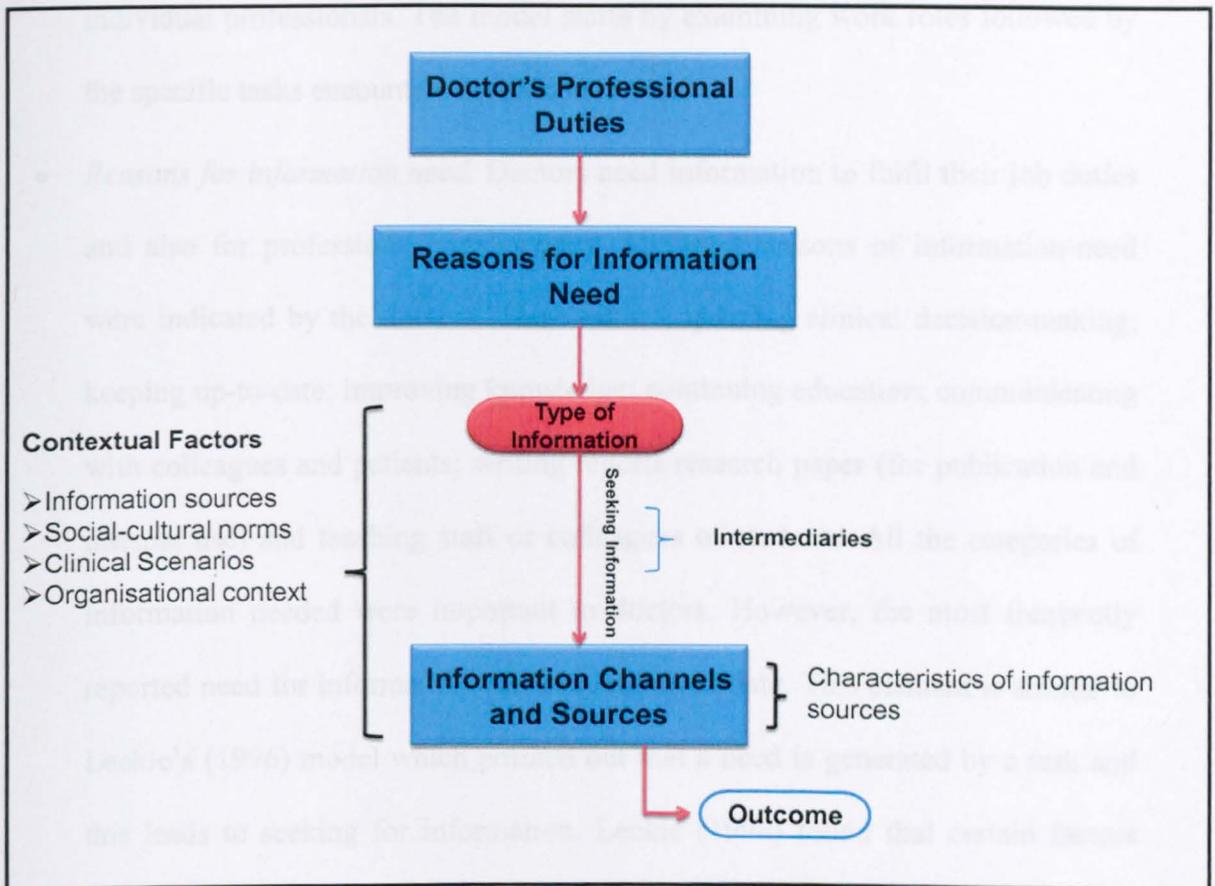
Figure 8.5: Doctors' information-seeking in Kuwait government hospitals

The model shows that the information-seeking of doctors is related to their profession. The model encompasses the following main components:

- *Doctors' professional duties*: The study investigated information needs and seeking of different categories of doctors: consultants; senior specialist; specialist; senior registrar; registrar; assistant registrar and trainees. It was found that hospital doctors performed a range of duties in the hospital which required information and that doctors were presented with different medical scenarios vis-a-vis their work role and associated tasks. For example, they provide patient care in different clinical scenarios: outpatients, wards and the emergency room. They also teach and train staff and students. This element is consistence with Leckie's (1996) model which explained the information-seeking behaviour of different

individual professionals. The model starts by examining work roles followed by the specific tasks encountered within each role.

- *Reasons for information need.* Doctors need information to fulfil their job duties and also for professional development. Different reasons of information-need were indicated by the doctors. They were: improving clinical decision-making; keeping up-to-date; improving knowledge; continuing education; communicating with colleagues and patients; writing reports/research paper (for publication and internal use) and teaching staff or colleagues or students. All the categories of information needed were important to doctors. However, the most frequently reported need for information was keeping up-to-date. This element is similar to Leckie's (1996) model which pointed out that a need is generated by a task and this leads to seeking for information. Leckie (1996) found that certain factors shaped the information needs of individuals such as their status in the organisation, years of experience and area of specialization. However, in the current study, it was found that there was a statistically significant association only between doctors' working experience and the need for information for teaching staff or colleagues or students. This indicates that the more experienced doctors are more likely to be involved in teaching.

- *Type of information.* Doctors identified four types of information they usually seek, namely: patient data; knowledge information; logistical information and statistical information. It seems that the type of information required is the bridge between the categories of information-need and the channels and sources of information. One element of Ellis' model - *'Extracting'* - showed that individuals go over a particular source and identify the related materials. This conflicts with this element in this study because in this case, the user first recognises the sort of

information they need, then he/she seeks a particular source of information to find the related information he/she needs.

- *Use of intermediaries.* The doctors indicated that sometimes they used intermediaries to help them in obtaining information. The most common types of intermediaries revealed by doctors were colleagues and search engines (e.g. Google). Utilising search engines for searching online is a normal activity for searchers indicated in the observation studies conducted by Madden *et al.* (2007) who found that "Searchers occasionally switched search engines rather than modifying their searches". In addition, a few of the doctors in this study reported that clinical librarians helped them find information and it was unexpected to find that some of doctors utilised nurses and porters when they faced language barriers in communicating with patient.

- *Information channels and resources.* Doctors sought information from various channels of information and sources including: the patient, patients' parents/friends, own personal knowledge and experience, personal collections, colleagues, communication with other medical staff (e.g. ambulance staff), the Internet, libraries, handbooks and journal articles. The sources are categorised according to format (paper, electronic, verbal and tacit knowledge) and location (internal, external and personal collection).

- *There were some contextual factors affecting doctors' information-seeking.* This element is somewhat similar to Leckie's model (1996) and that of Wilson (1999), which proposed that once the seeking process started, or information needs arise, there were some contextual factors affecting the individual's seeking process and its success or failure. However, in this study it was found that contextual factors affected the choice of information sources as well as the degree of use of the

information sources which, in the end, affected the result of doctors' information-seeking. The contextual factors were:

- Information sources: there were two factors associated with the context of information sources. The first factor was the awareness of information. It was found that the awareness of the availability of information sources and their usefulness is a factor influencing a doctor's seeking. For example, when doctors were asked about the reasons for not seeking statistical resources in their hospitals, they demonstrated a lack of awareness of the availability of statistical information sources. They also lacked an understanding of the usefulness of these resources in patient care. The second factor was the criteria involved in the choice of information resources. Doctors referred to various information sources but there were many factors associated with their choice of information sources, particularly when they searched the Internet. These included: familiarity; trustiness (reliability or helpfulness); timeliness (found when needed) and accessibility (relative ease of access).

- Other contextual factors: There were three main contextual factors surrounding the information-seeking of doctors namely: the socio-cultural context (family-cultural centre, social support, language barriers); organisational factors; (setting, resources and communication) and the scenarios context (clinical areas i.e. outpatient, wards and emergency room; and type of patient (new or old)). All these factors surrounded and hindered doctors' information-seeking.

- Outcomes: The conclusion of doctors' information-seeking was not investigated in this study; however, some predicated conclusions were made in the three

clinical scenarios which demonstrated the interdependent relationship between the three information domains (doctors' knowledge and experiences; patient data and knowledge resources) and clinical decision-making. The results also showed the degree of doctors' satisfaction regarding the information provision in their hospitals.

8.5 Summary

From the above discussion it is clear that doctors need information to keep up-to-date with good practice. The good practice can be achieved by improving the clinical decision-making. The clinical decision-making of doctors in the three clinical scenarios is driven by the integration of doctors' medical knowledge and patient data. It is evident also from the results and literature that knowledge-based resources enhance clinical decision-making. However, it is affected by contextual factors such as patient characteristics (e.g. language barriers), time constraints, the availability and accessibility of sources and the reliability of the information. Although previous studies have highlighted several vital sources of information sought by doctors, such as information provided by hospital libraries, electronic patient records, the Internet, and medical librarians, the study presented here expands the knowledge of doctors' information-seeking by identifying that the degree of use of these resources is different from one doctor to another and from one clinical scenario to another. The findings of the study should inform the future of health information provision in Kuwait government hospitals as they undergo development. Generally, there is a lack of information and there is a need to improve the current information provision system. Doctors are dominated by time. They have very limited time to see patients and to draw conclusions, particularly in

outpatients and emergency rooms. Therefore, doctors seek urgent information from accessible and critical information sources. And if their question remains unanswered, they usually seek information after work or during break times. Doctors in the study focused on the importance of digitizing information sources, such as patient files and hospital library resources, but the critical issue is perhaps not to digitize everything but to clarify how, where, why and when to seek the appropriate information to satisfy their needs. The results provide a snapshot picture of the information needs and information-seeking of doctors in Kuwait government hospitals and show that a range of information sources is used by doctors. This study set out to achieve some particular objectives. Reviewing the research aims and objectives with the key findings of the study is the focus of the next chapter. In addition, the chapter will conclude the thesis with recommendations and practical implications to enhance the information provision in Kuwait. Also, it will suggest further research to build on the findings of this study and continue to provide more details about issues that have not yet been covered.

Chapter Nine

Conclusion and Recommendations

9.0 Introduction

The research study is concluded in this chapter. The chapter consists of two main sections. Section one has conclusions derived from the research outcome, which are discussed in relation to the research questions, aims and objectives. The findings are linked by the type of data-collection instruments used to answer the research questions and achieve the aims and objectives. The findings of the study present the information needs and seeking of doctors in the Kuwait context, however, some of the research findings relate to issues in the wider world. In section two, a number of recommendations have been proposed based on the findings. In addition, some suggestions are also provided for possible future research in this and related areas.

9.1 Conclusion

This research represents the first exploratory study of the information needs and seeking of doctors in Kuwait government hospitals. Empirical data was gathered through using three data-collection instruments: focus groups, a semi-structured questionnaire and telephone interviews. The three data-collection instruments were conducted sequentially and each instrument was developed using findings from the preceding one, in addition to the research aims and objectives and reviewing the related literature. The research started with focus groups which explored issues around the topic and provided guidelines and categories which helped in designing the semi-structured questionnaire. The questionnaire survey was helpful in validating issues that arose in the focus groups by reference to a large sample of participants; it also provided a broad-brush approach to uncovering specific issues surrounding the information needs and seeking of doctors in Kuwait government hospitals. The telephone interviews proved valuable and provided more details on interesting issues arising from the questionnaire. All the data results that emerged from the three data-gathering instruments were analysed by using qualitative (thematic method) and quantitative (SPSS) methods. The findings of each data-collection instrument were triangulated, thereby providing deep and comprehensive data about the information needs of doctors; the internal and external channels of information they sought; the contextual factors surrounding and impeding their seeking process and their suggestions for, and opinions about, improving the current information provision in Kuwait government hospitals. There were three main aims that were addressed in chapter one, including:

Aim 1: To explore the information needs and information-seeking of selected doctors in Kuwait government hospitals.

Aim 2: To investigate the internal and external information sources used by doctors in Kuwait government hospitals.

Aim 3: To analyse whether the existing clinical information sources meet their needs

The main findings of the research are summarised below in relation to the research aims and objectives:

9.1.1 Information needs

Objective 1: To identify the reasons for the information needs of doctors in Kuwait government hospitals.

This objective met the first aim of the study. The results of the focus groups and questionnaires indicated that the nature of a doctor's profession required information for several reasons. However, the most frequently-mentioned needs were: keeping up-to-date; improving their clinical decision-making and maintaining their professional development (e.g. continuing education and writing reports). These three principle needs were clearly related to sustaining good practice. An interesting issue was raised from the finding which reflects the current issues in the world of knowledge, that doctors need information to answer their patients' questions and share information to improve their clinical decision-making. It was found that there was a statistically significant relationship between the information needed for teaching staff or students or colleagues and respondents' years of working experience. Respondents who had more years of

working experience were more likely to need information because of their involvement in teaching staff or colleagues or students.

9.1.2 Type of information

Objective 2: To determine the type of information doctors need for their medical practice.

This objective fulfilled the first and second aims of the study. There were four types of necessary information indicated by participants in the focus groups including: patient data; knowledge information; statistical information and administrative and logistical information. The results of the questionnaire and interviews showed the patient data and knowledge information were the most common types of information sought by doctors. On the other hand, a very small number of respondents revealed needing statistical information. The results of the study indicated that the type of information is a link element between the reasons for doctors' information needs and the different information channels and sources they sought to access.

9.1.3 Information-seeking behaviour

9.1.3.1 Information-seeking: source-context

Objective 3: To identify the various types of information sources that exist and are used by doctors in Kuwait government hospitals.

Objective 4: To identify other information sources doctors seek outside their hospitals and use for medical practice.

The objectives accomplished aims 1 and 2. Some key findings emerged from the three collections of data indicating the different types of information sources sought by doctors inside and outside the hospitals. This is summarised in the following sections.

Information provision in KGH

The empirical data revealed some key findings about the current information provision in KGH. Firstly, the results of the questionnaire indicated a lack of knowledge information, e.g. hospital libraries. The personal collection was the most used source of knowledge-based information reported by almost all of the respondents. Secondly, the three data-collection results revealed the lack of information and communication technology resources provided by hospitals. The Internet was available in all hospitals but it was only accessible in some areas, such as the offices of the heads of departments. A small number of respondents reported that they had databases in the hospitals; however, the databases that were available free were provided by private companies for a trial period only. Only Al Amiri hospital provided its doctors with an internal mobile and paging system. Thirdly, it was clear from the findings of the study that there was a great focus on improving the patient data rather than the knowledge information. The government Healthcare Information System is implemented in all hospitals except the Al Sabah hospital. The system was mainly used for facilitating the access to patient data and medical investigations and results. However, the system was still being developed and was in need of an upgrade. Thirdly, the results indicated the lack of doctors' awareness in locating the information they need in the hospital. Only two doctors

revealed that they obtained statistical information from the statistical department in their hospitals. Previous literature revealed the significance of the population statistical information. That is because the patient represents an individual within a whole population. Thus, understanding the common cases and disease in the public is a key indicator for improving patient healthcare.

Hospital and Health Sciences Libraries

The results identify the Health Sciences Centre Library in the Faculty of Medicine at Kuwait University as the most frequently visited library. However, the frequency of visiting the library was reported as being between 'rarely' and 'monthly'. The results of the focus groups and questionnaire showed that print serials and books were the most common types of information resources sought by doctors in the library. In addition, the questionnaire result demonstrated that abstracting journals and indexing journals were the tools used most by respondents to access library resources. It was found that there was little need to call for assistance from librarians. This finding appears unrepresentative since current thinking points to the impact of medical librarians and informationists in assessing doctors' information needs.

ICT resources

Despite the lack of ICT resources provided by the hospital, the results indicated the increasing demand of doctors in using ICT resources and their initiatives in coping with the rapid progress in information and communication technology in the healthcare area. The empirical data showed that nearly all the doctors accessed the Internet and on a

daily basis. 97.0% of the respondents accessed the Internet in their home whilst only 36.5% used it in the hospital. The results of this study also support the current views in the literature showing the growing use of mobile phones and PDAs in patient care. It was evident from the results of the three data-collection instruments that personal mobile phones were used most extensively to support doctors' clinical decision-making. Also, interviewees emphasised the importance of using personal PDAs in their medical practices. They revealed the advantages of using those technologies including: mobility, accessibility, independence, time-management and timeliness.

Interpersonal communication

The results of this study indicated that interpersonal communication was considered an essential channel for exchanging and sharing information in different contexts. It was found that doctors communicated with patients and patients' parents/relatives not only for obtaining necessary patient history data but also for them to be involved in decision-making about choosing medication and clinical procedures. The results added to the current knowledge in the literature pointing towards the new clinical decision model through patient involvement. The results demonstrated that doctors were heavily reliant on colleagues to obtain the information they need. The most common reasons for communicating were discussing patient cases and requests for second opinions. There was a statistically significant relationship between respondents' working experience and the reasons for communicating with colleagues. The less experienced the doctor, the more likely they were to communicate with colleagues who had more years of experience for reasons such as to discuss other patient cases; to ask for a second opinion; to share knowledge and to consult on admitting or discharging patients. However, more experienced doctors were more likely to provide second opinions for their colleagues

who had fewer years of experience. Doctors communicated with colleagues by using different methods but face-to-face and using mobile phones were the most frequent methods indicated by respondents in the questionnaire. It was clear from the results that email was the appropriate method utilised by doctors for communication with colleagues over long distances. The findings of the questionnaire and interviews showed that doctors also communicated with colleagues outside the hospital and mainly for managerial reasons, such as transferring a patient and locating facilities not available in their own hospital. Another interesting form of communication emerged from the relationship between doctors in the emergency department and ambulance staff. Doctors sometimes obtain information from them by asking about the clinical picture of the patient and the procedures and medication that had already been given to a particular patient.

Meetings, workshops and conferences

The results of this study indicated a professional form of interpersonal communication through doctors' attendance at different types of meetings in their hospitals. It was found that the daily, weekly and monthly meetings were regular meetings and required by their job descriptions. However, other meetings were attended for sharing information and professional development of which the most interesting, indicated by 54.0% of the respondents, was journal clubs. Only 28.5% of the respondents reported attended ICT workshops and courses. The findings of the study revealed the statistically significant relation between the attendance at some meetings and seminars and the organization the doctors worked for. Mubarak hospital participants were more likely to attend daily meetings and seminars in their hospital. This reflects the organisational setting of Mubarak as a teaching-based hospital. Thus, the daily running seminars will be normally

conduced in the hospital for teaching purposes. However, Al Amiri participants are more likely to attend weekly and monthly seminars and journal clubs inside the hospital but Al Sabah hospital participants were more likely to attend conferences and other seminars and meetings outside the hospital. The results provided an example of sharing information and knowledge inside an organisation (Al Amiri hospital) and outside an organisation (Al Sabah hospital).

Sources of drug information

The results from the three data-collection instruments indicated that doctors sought drug information from two main sources: a personal drug literature collection and by asking pharmacists. The interviewees revealed the reasons for asking pharmacists, which were to ask about the availability of a medication and correct dosages. In addition, they obtained information from pharmacists about the side effects of using some drugs.

9.1.3.2 Information seeking in the different scenarios

Objective 5: To investigate how doctors obtain and access the required information for their clinical decision-making in three different clinical area scenarios: outpatient department, wards and emergency rooms.

Objective 6: To examine the degree of use of a range of information sources by doctors in the three different clinical area scenarios (outpatient department, wards and emergency rooms) at Kuwait government hospitals.

This objective achieved aims 1 and 2. The results of the focus groups and interviewees indicated that doctors rely more on their knowledge and experiences when they

communicate with patients for clinical decision-making. This knowledge can be enhanced through the integration of patient data by asking patients, using patient medical records and requesting laboratory tests and other medical investigations. The questionnaire results indicated that the sources of patient data were used more frequently than sources of knowledge information in the three clinical scenarios. In particular, communication with patients and reading patient medical records were the patient data sources most frequently sought by respondents in the three clinical scenarios, followed by requesting medical tests and investigations and asking patients' parents/relatives. On the other hand, personal collections and asking colleagues were the most frequently used knowledge information sources in all three clinical areas. The results indicated that the Internet was used more than the library resources (printed resources) in the three clinical areas. The findings of the three data-collection instruments indicated that the ward area was the clinical area in which most doctors sought knowledge information sources. For instance, a high number of the respondents accessed the Internet in the wards and also 46.5% of the respondents indicated that they used it sometimes.

9.1.4 Criteria for choosing information

Objective 7: To identify the criteria doctors use in deciding which type of clinical information to use for medical practice.

This objective fulfilled aim two of the study. Participants in the focus groups and interviews indicated some factors in choosing health information when they accessed the Internet. They mentioned that the information should be clear, accessible, current, peer-reviewed and evidence-based. In addition, sometimes they looked for information

resources recommended by their colleagues. Also, the interviewees revealed that they obtained information from experienced colleagues.

9.1.5 Doctors' satisfaction with information resources and services

Objective 8: To examine whether the existing sources of information meet their needs in Kuwait government hospitals.

The objective accomplished aim 3. The results of the study revealed that doctors were dissatisfied with some of the information services and resources in their hospitals. The questionnaire results showed that most of the respondents were dissatisfied with the Healthcare Information System and also the services provided by hospital libraries. Also, around half of the respondents were dissatisfied with the lack of access to the Internet. In addition, the qualitative data of the focus groups and interviews showed that participants were mostly dissatisfied by the lack of accessibility of the Internet; the lack of ICT resources provided by hospitals, such as mobile phones, and by the communication with the patients to obtain the necessary information they need.

9.1.6 Contextual factors

Objective 9: To identify any barriers doctors encounter in accessing and acquiring information for medical practice in Kuwait government hospitals.

The above objective achieved the third aim of the study. The results of the three data-collection instruments indicated some contextual factors that could hinder or support doctors' information-seeking process for information they need. The factors were

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categorised in the following contexts: a) organisational context. This factor related to organisation policies and rules and also to the facilities and services that the hospital provided to doctors. For example, doctors from Al Farwania, Al Sabah and Mubarak complained regarding the lack of ICT resources (e.g. mobile phones) provided by the hospitals, however, the situation in Al Amiri is better. The interviewees in Al Amiri indicated that the hospital provided them with a pager and an internal mobile to facilitate communication between doctors and other departments. Other problems related to organisational factors included the small collections in their hospital libraries; the poor standard of information services provided by departments such as the medical records department, hospital libraries, laboratories and the X-ray department, the lack of training provided by hospitals in using ICTs resources, time constraints and the nature of information activities provided by the hospitals (e.g. journal club meetings); b) the socio-cultural context involved problems related to patient characteristics and the interactions with parents/relatives/friends/maids. The results showed that language barriers, a lack of patient awareness of medical terms and some social support issues (e.g. patients seeking information from unauthorised sources) were a big dilemma for doctors gathering the necessary information from patients; c) Information sources contexts. This factor related to awareness of information, its format (paper or electronic), availability, accessibility and location (internal or external) and the criteria for choosing information resources. Finally, d) the scenarios context was concerned mainly with the type of scenarios doctors faced (types of clinical area: outpatients, emergency departments and wards; and type of patients: new or old) For instance, the emergency department was a critical area for doctors needing to obtain information because it is where they meet patients who urgently need rapid treatments.

9.1.7 Information development

Objective 10: To determine suggestions from doctors for improving the current information provision.

Overall, this objective achieved aim three. Doctors stressed the importance of improving the current health information provision system in KGH. It was surprising to find the majority of doctors pointing to the health education needs of the patient. This should help in improving the patient's current awareness of general health information issues, particularly for common diseases (e.g. diabetes). This was thought to be a crucial factor in helping doctors to obtain the necessary and accurate patient history data and helping in the sharing of clinical decision-making with the patient. Another key suggestion provided by doctors was that the hospitals should provide and utilise ICT (e.g. mobiles and Internet) resources for healthcare. The core ambition for that is to enhance communication with colleagues inside and outside hospitals in order to have a great capability for accessing knowledge information resources and patient data. In addition, doctors suggested the i mprovement of the services provided by the medical record department and hospital libraries and one obvious hint they proposed was to train and provide highly-qualified staff in the medical record departments and hospital libraries. Another suggestion worthy of note was to motivate doctors and other healthcare providers to exchange and share information through providing more seminars and workshops on the current issues in health information. Doctors should be motivated for that through rewards, for example by small presents or a simple word of thanks and appreciation.

9.1.8 Conceptual models

Objective 11: To develop conceptual models for information provision to incorporate the expressed information needs of doctors in Kuwait government hospitals.

This objective achieved aims 1, 2 and 3. Two conceptual models were developed for this study. The first was a more specific model describing the information-seeking in the context of the scenarios described. This illustrated that clinical decision-making is driven from three domains: doctors' knowledge and experiences, patient data and knowledge resources. The three domains are integrated and there is an interdependent relationship between them and clinical decision-making. The clinical decision-making changes according to the degree of using the three domains. Beside that, the clinical decision-making affects the degree to which the three domains are used. The information-seeking process of doctors is surrounded by contextual factors which can hinder or support their seeking information and indeed their clinical decision-making.

- The second model was developed to illustrate the overview of information needs and seeking by doctors in Kuwait government hospitals. It consists of five main elements which are associated by relationships, processes and factors. The model starts with doctors' professional duties, which reflects two issues. Firstly, the nature of a doctor's job description requires information to fulfil their professional duties. Secondly, the information needs and seeking were investigated for all doctors' job titles, excluding medical students. Doctors in this study revealed several reasons for information needs but the most frequent need indicated by them was keeping up-to-date to maintain good practice. Only one factor indicated in this study, which was discussed in section 9.1.1, indicated the

statistically significant association between doctors' years of working experience and the need for information for teaching staff or colleagues or students. Then, to fulfil those needs, they sought information from several sources and channels of health information and this was shown in the third element in the model. However, before seeking the appropriate channels of information, doctors recognised that the sort of information they needed involved one or more of four categories: patient data; knowledge information; logistical information and statistical information. In addition, doctors utilised intermediaries (e.g. colleagues and Google) in their information seeking process to them obtain the information they needed.

Doctors revealed a variety of information channels and sources including the following:

- Doctors' knowledge and experience.
- Interpersonal communication (patients, patients' parents/relatives/maids, colleagues, nurses, pharmacist and ambulance staff, call other hospitals).
- Patient medical files.
- Order tests/investigations.
- Departmental collection.
- Personal collection.
- Drug literature.
- Healthcare Information System.
- The Internet.
- Library resources.

There were several contextual factors, which are explained in more detail in section 9.1.6 and affect doctors' information-seeking either positively or negatively. They are: information sources context; social- cultural context; organisational factors and scenarios context. These factors surround the information needs and the seeking process

of doctors and affect the degree of using information sources and indeed their outcome. This is indicated in the last element of the model which shows the outcome of the whole process of information needs and seeking. It describes two conclusions about clinical decision-making, such as in the scenario context and doctors' satisfaction with using the information services and sources in KGH.

9.2 Recommendations and implications for practice

According to the overall findings of the study, it was obvious that there is a need for a big shift in building and improving the system for providing health information in Kuwait government hospitals. Although change is likely to take time, it is clearly vital that a much-needed health information management service is supported by high-quality resources and advanced technologies. To ensure this, some recommended strategies and practical solutions are proposed. These short- and long-term plans and recommendations are intended for decision-makers in the MOH and KGH. Also, recommendations are made for the Library and Information Science and Health Informatics fields. These are:

For the MOH Decision makers

The decision-makers in the MOH in Kuwait need to secure healthcare information provision by taking the following steps:

Step 1: Strategic planning and management

Long-term plans
- Establish and implement a clear strategy and plan showing the flow of information provision in KGH and other related healthcare delivery systems.

This study has provided some guidelines for exchanging and sharing information for 'doctors' as one example of the healthcare providers in KGH. There is a need to have a comprehensive strategy and plan to demonstrate the information provision, exchange and communication between other healthcare providers in different healthcare delivery systems, both primary and tertiary.

- Involve user needs in the strategic planning process. For example, doctors are important end-users in accessing the HCIS and their needs and opinions are crucial in upgrading the current HCIS. Involving users in the strategic planning not only illustrates their needs, but, no less importantly, it illustrates the needs of users to the users themselves. For instance, the strategic plan will allow the user to recognise for themselves the need for change.

Step 2: Information system infrastructure

Long-term plans

- It is evidence from the results of the conceptual models there is a need to introduce an integrated and comprehensive system to link the three information domains together. As is evident from the scenarios model, doctors sought information from different channels, although the degree of using the sources was different from one scenario to another according to the contextual factors that surrounded them. Thus, introducing a system that has multiple functions and options will provide an opportunity for doctors to access the different domains of information sources.

- Walter and Lopez (2008, p.206) said "Physician acceptance of clinical information technology (IT) is important for its successful implementation". Implementing ICT (e.g. HCIS) holds promise but a successful system must be

mature, timely, have mobile capability and be cost-effective and adaptable to different scenarios.

- For a viable design of a successful health information system, resources to support evidence-based practice should be incorporated.

Step 3: Effective Information management

Short-term plans

- The focus of improving the information provision should include all the channels and sources of information. The decision-makers at the MOH should look at the situation from different angles. There is no doubt the clinical decision-making derives from three domains: doctors' knowledge and experience; patient data; and knowledge resources. All these resources need to be integrated to help doctors improve their clinical judgments and satisfy their other information needs. Thus, there is a need to feed the doctors with information for the three domains through a variety of information channels and sources. As is evident from the results, the MOH focuses more on improving the accessibility of patient data rather than ensuring support for the knowledge resources needed by doctors.

- Orientation and training programmes. Doctors need providing with different skills through courses and workshops including, for example, techniques for information-searching, communication with patients and using ICT resources in health care (Health Informatics). It is evident from the results that doctors communicate with different healthcare providers and medical staff to obtain the necessary information they need. The orientation and training programmes should also be provided to other healthcare professions in order to improve the quality and performance of health information provision.

- Utilising ICT resources in a healthcare delivery system is the key step in effective information management.

- Records should be sent to the Health Sciences Centre Library, which will need to extend its working hours.

Step 4: Improve the communication process.

Short-term plans

- As is evident from the results, communication in its different forms (formal, informal, interpersonal, electronically, face-to-face) was the core element in seeking and obtaining the necessary information. There is a need to plan and create policy to clarify the different aspects of the communication process.

- The provision of professional and well-trained medical translators in all hospitals to act as professional intermediaries between doctors and patients who do not speak Arabic or English is strongly recommended.

- Provide ICT resources such as a paging system, mobile phones, high-quality and speedy telephone operators, faxes, emails and good access to the Internet to help doctors in improving their communication to obtain the necessary information.

Long-term plans

- Prepare patients to become more involved in the doctors clinical decision-making process through improving their awareness of health information. This can be achieved through developing public policy focused on plans to improve consumer health information and patient involvement. Some starting steps include: providing free public seminars inside hospitals or clinics and medical centres; developing a health consumer website supported by the MOH; providing courses on issues such as searching for effective health information and

distributing relevant leaflets in hospitals and through other public media (T.V., radio stations, newspaper).

- There is a need to provide medical librarians to play an important role in assessing doctors' information needs and to help them in seeking out the required information. They should be trained to participate in the journal clubs and other meetings to help doctors in assessing their information needs. This can be achieved through training and assigning qualified staff in the hospital libraries and other medical libraries.

Step 5: Start to establish a rich electronic resources environment

Short-term plans

- Improve the accessibility of the Internet and provided access to online databases and resources.

Long-term plans

- There is a need to digitise all health information provision e.g. hospital libraries need to automate their functions and services to enhance access and the quality of services. Also, the data held by all other clinical department services such as Laboratory and X-ray, nurses, physiotherapists, pharmacy and other allied health departments should be digitised.

For KGH decision makers

Step 1: Improve information awareness

Short-term plans

- Improve the current awareness of the availability of information services in the hospital by providing posters in hospitals, providing orientation seminars and tour programmes for new staff doctors to introduce them to the different information services available in their hospitals.

- Provides seminars and lectures emphasising the importance of health information in doctors' medical practice, such as population statistics information.

- Report to health sciences libraries to provide doctors with updated information in their specialisms through the various electronic current awareness tools available in the libraries.

Step 2: Enhance the communication of information

Short-term plans

- Improved accessibility to online resources to be available in all units and sub-units in the hospitals to allow doctors to access information at any time and in any place they need it.

- Provide ICT resources such as a paging system, mobile phones, emails and a good telephone operator system. This will help doctors to communicate with different stakeholders to obtain the necessary information.

Step 3: Encourage knowledge-sharing

Short-term plans

- The results show the importance of knowledge-sharing and exchanging information inside and outside the hospitals. There is a need to enhance this aspect of sharing information and knowledge by introducing information

professionals to help doctors in assessing the high and based evidence information to present it in their meetings and seminars.

- Enhance the knowledge and information sharing by establishing an electronic information environment inside and outside the hospitals through providing online formal discussion groups and official medical weblogs.

Step 4: Orientation and training

Short-term plans

- Training will build confidence and positive attitudes in using and interacting with different systems of information provision, however, training should be extensive, well structured and formally scheduled. Some examples of training are search strategy techniques, online and electronic resources and looking for information to ensure good practice. Also, training is needed to improve communication skills and time-management.

- Train and assign qualified staff in the hospital libraries and other medical libraries. The training should not only include providing high-quality information services in the hospital libraries but also help them in assessing doctors' information needs.

- Provides health education programmes for patients inside the hospitals to improve their health information awareness.

Step 5: Information management

Short-term plans

- There is a need to manage and organise the health information in all the units and sub-units in the hospitals to help doctors in accessing and obtaining the

information they need. This can be accomplished by improving the services provided by information services departments such as hospital libraries and medical records departments.

- Provide clear and detailed information policy and procedures to all staff in the hospitals to help in understanding the flow and transforming of information.

- Train the staff to be qualified in providing optimal information services through providing seminars and workshops in communication.

- Encourage the heads of department and their assistants in the different healthcare provider units to attend doctors' meetings and seminars. This will help in understanding doctors' information needs.

- As indicated from the results, doctors working in hospitals had a range of duties as well as a range of information needs. They need to seek information, however, time is critical to them. Thus, time-management will be essential in allowing doctors to seek their information. Some suggested ideas include: providing an appointment list to limit the number of patients seen and reducing the duplication of accessing patient data in both the paper and electronic records. The MR department can help in entering the old patient data through providing volunteer employees working in extra time and rewarding them for that.

Contribution to the fields of LIS and Health Informatics (HI)

The findings from this study can contribute to future Health Information System development research in several important ways.

- Despite the fact that some of the empirical results were consistent with previous research on exploring the different knowledge information sources used by

doctors (e.g. Internet, Library resources and drug literature), this study involved three domains of information: knowledge sources, patient data resources and doctors' knowledge and experiences. This helped in distinguishing the degree to which the different information sources are used for medical practice.

- The findings of this study proposed conceptual models of integrated information provision which will help in improving the information provision system in any hospitals in which such a system does not exist.

- The results of the study indicated several contextual factors (socio-cultural context, scenario context and organisation context) that affected doctors' information-seeking. This finding, added to the other factors found in the literature, focuses on the system context (search skills, reliability of information, time constraints) and hence, considering various contextual factors, deserves attention during the development of a successful Health Information System.

- The scenarios for information-seeking provided some guidelines in assessing the information needs of doctors. The most obvious outcome from the model was the interdependent relationships. These indicated that in developing any conceptual model, particularly for healthcare providers, some concepts need particular attention including the 'three domains of information', 'decision-making' and uncertainty.

- This study used a sequential, mixed-methods approach which helps in investigating the problems in sequential stages thus providing more depth and valid data. There is a need for encouraging more methods for LIS and HI fields.

9.3 Further research

This research study provided the foundations of the information needs and seeking in Kuwait government hospitals and suggested the following further studies:

- The information-seeking models demonstrated one example of healthcare providers, "doctors", however, these models need to be tested for doctors working in other healthcare delivery systems, such as primary and tertiary healthcare delivery, to extend the picture of doctors' information needs and seeking throughout the Kuwait healthcare delivery system.

- There is a need for an in-depth study to focus on investigating the use of ICTs resources, such as PDAs, in patient care.

- There were several contextual factors investigated in this study, which either supported or obstructed doctors' information-seeking processes. There is a need for a study to explore those factors in more depth and provide more guidelines and practical solutions.

- A study is needed to assess the performance of medical librarians and informationists in meeting doctors' information needs, particularly in Middle East countries, where there have been few studies that have raised the issue in an effective manner.

- Conduct a study in health information management to explore the guidelines and principles for managing an effective information environment for an optimal information provision system.

- There is a need for a study to understand concepts such as 'patient health education' or 'patient involvement' and 'consumer health information'. Also, the role of doctors with these different concepts needs identification.

- The final recommendation for future research would be to evaluate degree of use of different types of information in clinical decision-making in the three domains in reducing the uncertainly when making clinical decisions.

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Appendix I: Published Conference Paper

ICT Use by Doctors in Kuwait Public Hospital

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Abstract: This paper presents selected results from a large study which explored the information needs and information seeking of doctors in four public hospitals in Kuwait. The paper focuses specifically on the results pertaining to Information Communication Technology (ICT) use. A strategy of sequential mixed method procedures was followed using focus groups, a paper-based questionnaire and semi-structured telephone interviews. The results established a picture of the ICTs used by doctors and suggest that enhancing ICTs in Kuwait public hospitals (KPH) is key to improved healthcare services and sound clinical decision making.

Introduction

Information Communication Technologies (ICTs), such as the Internet and computer based patient records, have the potential to improve health information provision by facilitating the production, storage, processing, dissemination and exchange of clinical information. This study explores these issues within a Kuwait context. Kuwait is small and wealthy country, located in the Middle East. In recent years, the government in Kuwait has sought to join the Information Age through a series of government work programmes. One obvious feature of this is the use of ICTs in all government sectors.

Today, Kuwait is the third largest information technologies market in the Gulf region, after Saudi Arabia and the U.A.E [1].

Turning specifically to Kuwait's healthcare services, a primary health care system has been implemented in all primary health care centres in Kuwait in recent years and the implementation of a secondary health care system (HCIS) in hospitals is underway. The research reported here explored the extent to which the system is being used by doctors in their medical practice and also sought to identify other ICT resources used by doctors. In addition, the study identified doctors' difficulties in using ICTs for obtaining the information they need for clinical decision making.

Research method

Three stages of data collection were adopted in this research: focus groups, a paper-based questionnaire and semi-structured telephone interviews. This mixed-method approach, or triangulation, aims to explore the issues involved in the research from many points of view to improve the consistency of the data [2]. The study was conducted in four public hospitals in Kuwait: Al Sabah hospital, Al Farwania hospital, Al Amiri hospital and Mubarak hospital. Three focus groups and 20 semi-structured telephone interviews were conducted. 1000 paper-based questionnaires were disseminated to all doctors working in the four study hospitals in January 2008 and the data collection was completed in February 2008. 541 questionnaire responses were received, giving a response rate of 54%.

Results and Discussion

The results showed a general lack of information technologies in the KPH. A very small number of respondents indicated they had online databases in their hospitals and when they did they were free databases provided for trial periods only. In addition, the facilities for accessing information resources were not distributed equally between the departments in the hospitals. For example, the accessibility of the Internet was very limited. It was available in some doctors' offices in the wards and in the offices of consultants and heads of departments. The results showed that the Health Care Information System (HCIS) was available in all hospitals except Al Sabah hospital. Doctors' use of the system varied between the three hospitals, however. It had only

recently been introduced in Mubarak hospital at the time of the primary research and used only for entering data such as patient diagnosis, progress and medication and writing discharge summaries. The system had made more progress in Al Amiri and Al Farwania hospitals and was used to enter patient data and the results of investigations, such as laboratory tests and X-rays results. The interviewees stated their problems in using the current HCIS. There was no facility in the system to retrieve old patient data, for example, so patient data were repeated for every patient admission. Other problems were that the system does not show the results of investigations, it did not provide a statistical summary of cases and the system also suffered from frequently being down and unavailable

Although the results of the study showed a lack of ICT resources within Kuwait government hospitals, the doctors indicated that they relied heavily on ICT for accessing the information they needed for clinical practice. Almost all respondents said that they used the Internet, nearly all of them reported that they used it at home and around a quarter of the respondents used the Internet in the hospital. The low use of the Internet in hospitals raises two critical issues. First, since doctors are professionally very time pressured, they do not have time to access the Internet in the hospitals. Time constraints on searching online resources have been similarly indicated by several previous studies [3, 4]. The second issue is that because the Internet is not accessible in all departments in the hospitals, doctors rely on using the Internet at home. This was confirmed by the questionnaire results which showed that around half of the respondents were dissatisfied with the accessibility of the Internet in their places of work. The situation was similar to that in studies by Tan, Stark, Lowinger, Ringland, and Pearson [5] and Ajuwon [6] which indicated that doctors were dissatisfied with the accessibility of the Internet in their hospitals. The most common reasons for accessing the Internet were for email and for keeping up-to-date. An interesting issue arising from the results was that more than half of the respondents in the questionnaire obtained information from the Internet to answer their colleagues' questions and also patient questions. It seems that interpersonal communication is an important motivating factor encouraging the doctors to obtain information from the Internet. There is evidence in the literature that doctors are experiencing patients bringing Internet printouts to consultations [7]. Thus, doctors need to be ready to cope with patient expectations. The most frequently accessed resources on the Internet were online databases such as MEDLINE, PubMed and NEJM.

The use of telephones, personal mobile phones in particular, to obtain information was another notable feature on the study. Most of the participants in the focus groups and interviews indicated the necessity of using mobile phones to communicate with their colleagues. They revealed that mobiles facilitated quick consultations with their colleagues. Also, sometimes they shared cases and discussed new issues arising in their specialist area by phone. The questionnaire results supported that and showed that the majority of respondents (82.4%) communicated with their colleagues by mobile. Another interesting issue found in this present study was that the interview results indicated that a few participants obtained information from medical programmes by watching T.V. and listening to radio stations. They mentioned that the media provided them with good information about handling emergency cases but stressed that information should be evidence based.

It was found that personal collections, consisting primarily of electronic resources, was the information source used most frequently by the respondents (81.9%) in the four hospitals. Most of the doctors in the interviews and the focus groups indicated that they usually accessed wireless Internet via their personal PDAs and laptops. There is also evidence from the literature that PDAs play a crucial role in doctors' medical practice [8, 9]. Most of the doctors in this study subscribed to some online journals such as NEJM, EMJ, the Lancet and Paediatrics, and they also accessed departmental guidelines and PowerPoint handouts from seminars and workshops via these technologies. Generally, all interviewees emphasized the importance of using their personal collections and said this was their preferred source of information for a number of reasons. Firstly, they reported that their personal collection satisfied their information needs including help in practicing their profession, keeping them up to date with new developments in their specialty, improving their clinical decision making and providing information for lectures and seminars. Secondly, their personal collections gave them independence and the capability for better and more effective time management. Thirdly, they indicated that these are quick reference sources which they can use in any place and whenever they want them. They are also good sources to refer to in emergency cases,

Conclusion

ICT implementation is an ongoing government policy in the Kuwait Public Hospitals. It has been found in this study that doctors are adapting to cope with the new

developments in information technologies in their environment by utilizing their personal ICT tools. There is an obvious shift from using traditional ICT resources such as CD-ROMs and desktops to PDAs and mobile resources. Mobile ICT resources could be the ideal tools for doctors who are often busy moving from one scenario to another in their working day and need to be able to keep up to date with the latest information at all times.

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Appendix II: Organization Chart of the Structure of Kuwait MOH

Minister of Health

- Kuwait institute for the medical specializations
- Undersecretary of the Ministry
- Office of supervision and follow-up
- Minister office administration

- Central administration of the Medical Services
- Treatment Abroad
- Public Relations and Media
- General Medical Council
- legal Advisor
- Undersecretary office Administration

AU Planning
- Planning and Follow up
- Health awareness

AU Blood transfusions and medical laboratories
- Blood transfusion
- Medical Laboratories

AU Financial and services
- Financial accounting
- Budget and Control
- Procurement and stores
- contracts Account
- Public services
- Engineering
- Waste management
- Health insurance

AU Administrative Affairs
- Personnel
- Human development
- Evaluation and measurement
- Training and development

AU Quality control
- Quality assurance
- Medical records and Statistics
- Information systems
- Health Development Office
- ROSP

AU Legal Affairs
- Legal and Investigations
- Central registry of births, deaths
- Overall record
- General Secretariat

AU Control of Pharmaceutical and food
- medicine Inspection
- RCMMP
- LNSPPM

AU Medicines and medical supplies
- Medical stores
- Pharmaceutical services
- Medical engineering

AU Dental
- Dental services

AU Public Health
- Public health
- Control of radiation
- Prevent infection
- Occupational Health
- Health-Arab relations
- International organizations
- International agreements

AU Medical assistance services
- emergency medical
- Nutrition and feeding
- Nursing services
- Physiotherapy
- Social service

AU Health care
- Health regions
- Primary health care

AU Medical services
- Licenses health
- Health affairs of the police

Au: Assistant Undersecretary

RCMMP: Registration & control Of medicines and medical plants

LNSPPM: Licenses of narcotic Substances and preparations, a psychotropic the mentality

ROSP: Regional Office for the safety of patients.

Appendix III: Focus Group Agenda

AGENDA

Focus groups Meeting Agenda

Date: ..... October 2007
Time: 8:00 a.m. – 9:00 a.m.
Location: Meeting Room in Ward..... In............. Hospital

Meeting called by PhD student Elham Aldousari

8:00 a.m. – 8:05 a.m.	**Welcome & Introduction** Refreshments Welcome *Moderator and Assistant*
8:05 a.m. – 9:00 a.m.	**Topic discussion** Doctors' views of various information sources for medical practice
9:05 a.m.	**Close**

Additional Instructions:

Please arrive no later than 07:45am.

Audio tape will be used to record the meeting

If you are unwilling to attend the meeting, PLEASE, inform us before two days of the meeting date. You attendance is necessary. If you have questions about the focus group meeting, PLEASE do not hesitate to contact via 6690808 or send email to e.aldousari@lboro.ac.uk

Thank you

Elham Al-dousari
PhD Student
Department of Information Science
Loughborough University
UK

Appendix IV: Focus Groups Discussion Guide

FG Guide

Introduction (10 min)

Ask participants to complete profile questionnaire and informed consent

Introduction and Icebreaker

- Tell me about the locations where you see your patients in the hospital?
- Which are the preferable places for communicating with patients?

Topic Discussion (50 min)

- Information needs of doctors
- Information seeking of doctors
- Obstacles in obtaining information
- Improving information provision in Kuwait

Probes & prompts for general discussion

Probe: What type of information resources do you use when you see your patients in the outpatient area?

Probe: What about other areas such as wards? or ER?

Probe: Are there any other external information resources you use for patient's diagnosis/treatment?

  -Prompt: Do you have hospital libraries in your hospital? If yes, do you visit the library?

Probe: Do you visit another library?

Probe: Tell me more about the resources and services you use in the library?

Probe: What problems do you face in obtaining information?

  -Prompt: Tell me about problems in using the hospital library?

  -Prompt: Do you have problems in using patients' medical records ?if so, what?

  -Prompt: Do you have difficulties in searching the Internet? If so ,what?

Probe: What criteria do you use when you look for health information?

  -Prompt: E.g. Internet, ask colleagues?

Probe: In your opinions, what do you suggest to improve the current information resources and services?

Summary by moderator

Conclusion (5 min)

Are there any other issues related to information resources you would like to add?

Thanks and close

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Appendix V: Informed Consent Form

<div dir="rtl">

إقرار مستنير بالمشاركة في دراسة
</div>

Informed Consent I

Dear Doctor...
You have been chosen to participate
in the following study:

<div dir="rtl">

عزيزي الزميل الدكتور...............

لقد تم اختيارك لتكون مشترك معنا في الدراسة الآتية::
</div>

Information Needs and Information Seeking of Doctors in Kuwait Government Hospitals

This study will investigate the different types of information
sources needed and used by doctors to assist them in clinical decision making in Kuwait
Hospitals.

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تقوم هذه الدراسة بالتعرف على المصادر

المعلومات الطبية التي تساعد الأطباء باتخاذ القرار الطبي لتقديم خدمه أفضل للمريض في مستشفيات الكويت

وسوف تقوم المشاركة من خلال المقابلات التلفونية والمقابلات الجماعية والاستفتاءات
</div>

Your contribution to the research will take the form of a telephone interview (focus groups,
questionnaire). This will be tape-recorded and transcribed.

The tape-recordings will be kept securely and destroyed in due course.

Of course you have the right to participate or not; and we
will deal with information confidentially.

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بالطبع لك حرية الموافقة على
المشاركة بالدراسة أو الرفض, وفى حاله مشاركتكم سيتم التعامل مع جميع البيانات بسريه تامة.
</div>

Do you agree to participate:

<div dir="rtl">

هل أنت موافق على المشاركة في
الدراسة:
</div>

☐ Yes

☐ No

<div dir="rtl">

☐نعم

☐ لا
</div>

Signature

<div dir="rtl">

التوقيع
</div>

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نشكر لك تعاونك معنا
</div>

Thanks for your cooperation

Appendix VI: Questionnaire

Questionnaire

Information Needs & Information Seeking of Doctors in Kuwait Government Hospitals

Dear Colleague

I am a Doctoral student in the Information Science department, Loughborough University, UK, currently conducting research on the "Information needs and Information Seeking of doctors in Kuwait Government Hospitals". The study aims to explore and investigate your information needs and information seeking for clinical decision making, and the results of this study will be used to suggest improvements to the quality of health information services in Kuwait hospitals. This study is supported by the Kuwaiti Ministry of Health.

The questionnaire is divided into sections including: *demographic data; information needs; information seeking; information resources; problems in obtaining information* and *improving current information resources and services*. Most of the questions are *Tick* questions, to save your time.

I would really appreciate it if you could spend about 10-15 minutes in filling out the questionnaire. The information that you provide will be treated in the strictest confidence.

Your answers will help me to identify your information needs and will contribute to improving health information services and providing high quality healthcare in Kuwait. *If you have any queries, you can contact me on 6690808.*

Thank you for your cooperation

Sincerely,
Elham Aldousari

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A.   Demographic Data

*PLEASE **TICK** THE BOX WITH THE APPROPRIATE ANSWER*

A.1 Gender
- ❑ Male
- ❑ Female

A.2 Age
- ❑ Under 30
- ❑ 41-50
- ❑ Over 60
- ❑ 31-40
- ❑ 51-60

A.3 Nationality
- ❑ Kuwaiti
- ❑ Non-Kuwaiti

A.4 Organization where you normally work
- ❑ Al Amiri Hospital
- ❑ Al Farwania Hospita
- ❑ Al Sabah Hospital
- ❑ Mubarak Al-Kabeer Hospital
- ❑ **Other** *(PLEASE SPECIFY)*..........................
....

A.5 Department
- ❑ General Surgery
- ❑ Internal Medicine
- ❑ Orthopedics
- ❑ Obstetrics & Gynaecology
- ❑ Urology
- ❑ Paediatrics
- ❑ Emergency/Casualty Unit
- ❑ E.N.T
- ❑ **Other** *(PLEASE SPECIFY)*.......................................

A.6 Highest education level
- ❑ Bachelor's   ❑ Master's
- ❑ PhD
- ❑ Other *(PLEASE SPECIFY)*......................

A.7 Job title
- ❑ Consultant   ❑ Senior Specialist
- ❑ Specialist   ❑ Senior Registrar
- ❑ Registrar   ❑ Assistant Registrar
- ❑ Trainee   ❑ Medical Student
- ❑ **Other** *(PLEASE SPECIFY)*...........................

A.8 Working experience since qualifying
- ❑ Less than one year
- ❑ 1-5 years
- ❑ 6-10 years
- ❑ 11-15 years
- ❑ 16-20 years
- ❑ More than 20

A.9 Working experience in Kuwait hospitals
- ❑ Less than one year
- ❑ 1-5 years
- ❑ 6-10 years
- ❑ 11-15 years
- ❑ 16-20 years
- ❑ More than 20

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B.   Information Needs

B.1 Which of the following information needs apply to your work in medical practice? *(PLEASE TICK ALL THAT APPLY)*

- ☐   Improving your clinical decision making
- ☐   Keeping up-to-date
- ☐   Improving your knowledge
- ☐   Continuing education
- ☐   Sharing knowledge with your colleagues
- ☐   Answering colleagues' questions
- ☐   Answering patient questions
- ☐   Writing reports/research paper(not for publication)
- ☐   Writing reports/research paper(for publication)
- ☐   Teaching staff/students/colleagues (e.g. case presentations)
- ☐   **Other** *(PLEASE SPECIFY)*...

C.   Information Seeking

C.1 What type of information resources do you have available in your hospital where you normally work? *(PLEASE TICK ALL THAT APPLY)*

- ☐   Hospital library
- ☐   Departmental collection (e.g. books, journals, tapes & drug literature)
- ☐   Office telephone
- ☐   Mobile telephone provided (i.e. not personal)
- ☐   Internet
- ☐   Online databases (e.g. Medline)
- ☐   Annual reports/statistics (from statistical department)
- ☐   Personal collection (e.g. books, journals and reports)
- ☐   **Others** *(PLEASE SPECIFY)*...............................

C.2 What type of meetings do you attend for medical practice? *(PLEASE TICK ALL THAT APPLY)*

- ☐   Ward round
- ☐   Daily meeting/seminars in your hospital
- ☐   Weekly/monthly meeting/seminars in your hospital
- ☐   Journal clubs
- ☐   Other meeting/seminars in other hospitals
- ☐   Attending conferences
- ☐   Courses/workshops in other organisations (e.g. computer training)
- ☐   **Other** *(PLEASE SPECIFY)*...............................

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C.3 Please *CIRCLE* **the degree to which you use the following resources when you see a patient in the Wards, Outpatient and Casualty areas for clinical decision making?** *(IF YOU ARE A DOCTOR WORKING ONLY IN THE CASUALTY AREA, PLEASE ANSWER THE SECTION ON CASUALTY ONLY).*

0= Not Applicable   1=Never   2=Sometimes   3=Frequently

Resources	Outpatient				Wards			Casualty		
Ask patient	0	1	2	3	1	2	3	1	2	3
Ask patients' parents/relatives/maids	0	1	2	3	1	2	3	1	2	3
Ask your colleagues	0	1	2	3	1	2	3	1	2	3
Ask nurses	0	1	2	3	1	2	3	1	2	3
Ask pharmacist	0	1	2	3	1	2	3	1	2	3
Ask ambulance staff	0	1	2	3	1	2	3	1	2	3
Patient file/medical record	0	1	2	3	1	2	3	1	2	3
Order tests/Investigations	0	1	2	3	1	2	3	1	2	3
Departmental collection (books, journal articles & reports)	0	1	2	3	1	2	3	1	2	3
Drug literature	0	1	2	3	1	2	3	1	2	3
Hospital Computer system	0	1	2	3	1	2	3	1	2	3
Internet	0	1	2	3	1	2	3	1	2	3
Your personal collection (books, journals, notebook, and reports)	0	1	2	3	1	2	3	1	2	3
Use library resources	0	1	2	3	1	2	3	1	2	3
Call other hospitals	0	1	2	3	1	2	3	1	2	3
Other *(PLEASE SPECIFY)*	0	1	2	3	1	2	3	1	2	3

D.   Information Resources

D.1 For what reasons do you use the patient file/medical record? *(PLEASE TICK ALL THAT APPLY).*

☐   To record patient data (e.g. history, diagnosis & treatment)

☐   To read patient history

☐   Writing report

☐   Discuss cases in meetings & committees

☐   To follow up patient progress

☐   Research study

☐   Other *(PLEASE SPECIFY)*...

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D.2 Which library do you most frequently visit? *(PLEASE TICK ONE BOX).*

    □   Hospital library

    □   Other external library *(PLEASE SPECIFY)*...

    □   None *(GO TO QUESTION D.6)*

D.3 How often do you visit this library? *(PLEASE TICK ONE BOX).*

□	Daily	□	Once a week
□	Once a month	□	Rarely

D.4 What type of information resources do you seek in the Library? *(PLEASE TICK ALL THAT APPLY).*

    □   Books

    □   Serials (e.g. journals, periodicals, magazines & newspapers)

    □   Internet

    □   Medical databases (e.g. Medline)

    □   Thesis/research paper/reports

    □   Government publications

    □   Statistics/Annual reports

    □   Video tapes/Microfilms

    □   Conferences papers

    □   Other *(PLEASE SPECIFY)*...

D.5 Which tools do you use to get access to the information you need in the library? *(PLEASE TICK ALL THOSE THAT APPLY).*

    □   Library catalogue

    □   Indexing journals

    □   Abstracting journals

    □   Bibliographies produced by library staff

    □   Ask Librarians

    □   Other *(PLEASE SPECIFY)*...

D.6 Do you use the Internet for health information? *(PLEASE TICK ONE BOX).*

    □   Yes   □   No *(GO TO QUESTION D.8)*

A

D.7 Where do you use the Internet? *(PLEASE TICK ALL THAT APPLY)*.

☐ Hospital ☐ Hospital Library ☐ Other Libraries

☐ Home ☐ Internet Café

☐ Other *(PLEASE SPECIFY)*...

D.8 Please *CIRCLE* the frequency **for which you use the library and Internet for the following reasons.**

1=Never   2=Sometimes   3=Frequently

Reasons	Library			Internet		
Personal use (e.g. email)	1	2	3	1	2	3
Improve your Clinical Decision making	1	2	3	1	2	3
Knowledge Improving	1	2	3	1	2	3
Keep up-to-date	1	2	3	1	2	3
Continuing education	1	2	3	1	2	3
Answer colleagues' questions	1	2	3	1	2	3
Answer patients' questions	1	2	3	1	2	3
Research/reports/Articles	1	2	3	1	2	3
Teaching staff/students	1	2	3	1	2	3
Other (PLEASE SPECIFY)...........................	1	2	3	1	2	3

E.   Communication

E.1 How do you communicate with your colleagues in the hospital? *(PLEASE TICK ALL THAT APPLY)*.

☐ Face to face ☐ By office telephone

☐ By mobile/cell phone ☐ By email

☐ By meeting ☐ By sending letter

E.2 What are the reasons for communicating with your colleagues? *(PLEASE TICK ALL THAT APPLY).*

- ☐ To ask for second opinion
- ☐ Discuss cases
- ☐ Sharing knowledge
- ☐ Consult for admitting or discharging patients
- ☐ To give second opinion
- ☐ **Other** *(PLEASE SPECIFY)*...

F. Problems in Obtaining Information

F.1 Which of the following have been a problem for you? *(PLEASE TICK ALL THAT APPLY).*

- ☐ Library not available in your hospital
- ☐ Library is available in your hospital but located very far from your department
- ☐ In adequate resources in hospital Library
- ☐ Lack of information technology such as mobile, email to communicate with your colleagues.
- ☐ Language problem in communicating with patients/patients' parents/relatives/maids
- ☐ Lack of patient awareness in understanding medical terms
- ☐ Gathering patients' information from patients' parents/relatives/maids
- ☐ Lack of time to talk with patients
- ☐ Patient missing appointments
- ☐ Missing patient files
- ☐ Inaccessibility of the patient files
- ☐ Unorganized forms in the patient files
- ☐ Missing forms & incomplete information in the patient files
- ☐ Lack of help from Medical Records staff.
- ☐ Too much information on the Internet
- ☐ High cost of subscription of electronic journal.
- ☐ Lack of searching skills
- ☐ No facility to communicate with other hospitals
- ☐ **Other** *(PLEASE SPECIFY)*

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G. Improving Information Resources & Services

G.1 Please INDICATE your degree of satisfaction in using the following information resources, services and practicing other activities for gathering information.

Information resources/services/activities	Not applicable 0	Dissatisfied 1	Neutral 2	Satisfied 3
Services provided by hospital library	0	1	2	3
Services provided by Medical Records department	0	1	2	3
Communication with other departments (e.g. Labs, nursing, X-ray) in your hospital	0	1	2	3
Accessibility of the Internet	0	1	2	3
Communication with your colleagues	0	1	2	3
Communication with your patients	0	1	2	3
Communication with other hospitals and health centres	0	1	2	3
Daily/weekly/monthly meeting and seminars	0	1	2	3
Hospital Information System	0	1	2	3
Attending conferences	0	1	2	3
Other (PLEASE SPECIFY)...........................	0	1	2	3

G.2 What do you think would most help develop and improve health information resources and services in Kuwait hospitals? *(PLEASE TICK ALL THOSE THAT APPLY).*

☐ Health Education for patients

☐ Provide hospital library

☐ Provide better qualified staff in the Medical Records (MR) Department

☐ Provide better qualified staff in the hospital library

☐ Digitize all information services such as MR and Library

☐ Train doctors on the use of the Internet and Information Technology

☐ Improve communication with other hospitals and health centres

☐ Improve communication with other international hospitals and healthcare centres

☐ **Other** *(PLEASE SPECIFY)..*

Would you like me to send you a summary of the research results?

☐ Yes ☐ No

If YES, PLEASE PROVIDE YOUR EMAIL ADDRESS ....

I may wish to do some follow- up interviews. If so, would you be willing to be interviewed by me?

☐ Yes ☐ No

If YES, CAN YOU PLEASE INDICATE YOUR NAME , PHONE NUMBERS AND EMAIL ADDRESS. ....

Thank you for your cooperation

Appendix VII: Interview Guide

Interview Guide

Introduction (5 min)
- Welcome and Icebreaker.
- Review the questionnaire.

Topic Discussion (35 min)
- Doctors' information needs for medical practice.
- Use of health Information sources such as personal collection, Internet, library and interpersonal communication.
- Problems in obtaining information for medical practice.
- Suggestions in improving information provision in Kuwait government hospitals.

Prompts for general discussion
- looking at the questionnaire results, most doctors mentioned they need Information for keeping up to date, please tell me how keeping up to date with information is an important need for your medical practice?
- Do you have any other needs?
- Tell me about the type of resources in your personal collection?
- How do you keep it updated?
- Where do you keep it in the hospital?
- How is it important to you?
- How frequently do you use the Internet?
- What websites do you search for health information?
- What are your criteria for choosing the websites?
- Tell me about your experience of using the Health Care Information System?
- How useful do you feel it is to have a mobile telephone provided by the hospital?
- Could you explain why you rarely visit the library?
- What is the value for using library?
- Do you think you need a library in your hospital? why?
- Do you need help when you search for Information in the library? If yes? how?
- Could you explain why sometimes doctors ask pharmacists for information?
- What is the value of asking pharmacists for Information?
- Could you explain the reason for attending daily meetings?
- What are the different purposes of attending daily, weekly and monthly meetings?
- What do you discuss in these meetings?
- What are your suggestions to improve the health education in Kuwait?
- Did you work with other health care organization outside Kuwait such those as n the UK, USA?
- Could you explain your experiences with the information systems there?
- Do you have other problems in obtaining the health information you need that you would like to mention?
- Would you like to provide any suggestions for improving the current health Information provision in Kuwait?

Conclusion (5 min)
- Are there any other issues related to information provision services and resources you would like to add?
- Thanks and close

Appendix VIII: Official Letter from SCCHMR in the Kuwait MOH

MINISTRY OF HEALTH

Reference : ....

Date : ....

دولة الكويت
ة الصحـــة

م : ....٧٥٩..........
غ : ....٩/-١٠/-٢٠١٧......

السيد الدكتور/ وكيل الوزارة المحترم

تحية طيبة وبعد ،،

بالإشارة للكتاب الوارد من السيد/ عميد كلية العلوم الاجتماعية بجامعة الكويت(رقم 22 بتاريخ 9/30 /2007) بشأن طلب تسهيل مهمة السيدة/ الهام عباس الدوسري معيدة عضو بعثة بكلية العلوم الاجتماعية بشأن إجراء دراسة حول استخدام مصادر المعلومات بالرعاية الصحية.

يرجى الإحاطة بأنه وفقا لتوصيات اللجنة الدائمة لتنسيق البحوث الطبية والصحية فقد قامت اللجنة الفرعية التابعة للجنة الدائمة لتنسيق البحوث الطبية والصحية بمناقشة بروتوكول مشروع البحث المقدم من الباحثة/الهام عباس الدوسري (طالبة دكتوراه بجامعة لافبرو بالمملكة المتحدة) وعنوان البحث:

"استخدام مصادر المعلومات الطبية بواسطة الأطباء لتشخيص المرض واتخاذ القرار الطبي في مستشفيات الكويت الحكومية"

وقد أوصى اعضاء اللجنة بتاريخ 2007/10/8 بالموافقة على بروتوكول البحث مع مراعاة تعهد الباحثة بالمحافظة على سرية البيانات الشخصية للمشاركين بالدراسة و عدم استخدام أي معلومات خارج نطاق البحث والحصول على إقرارات مستنيرة INFORMED CONSENT قبل إجراء المقابلات مع الأطباء المشاركين بالدراسة.

ونظرا لكون البحث يتم بالمستشفيات الحكومية (بإجراء مقابلات مع عينة مختارة من الأطباء) يرجى التفضل بالاطلاع ومخاطبة السادة/ وكيل الوزارة المساعد لشئون الرعاية الصحية والسيد/ مدير ادارة الإحصاء و السجلات الطبية والسيد/مدير الخدمة الاجتماعية برجاء تسهيل مهمة الباحثة لإجراء المقابلات حسب بروتوكول الدراسة .

وتفضلوا بقبول فائق الاحترام ،،،

رئيس اللجنة الدائمة
لتنسيق البحوث الطبية والصحية
الدكتور علي يوسف السيف
وكيل الوزارة المساعد
لشئون الصحة العامة