



**Information Experiences and Practices of Paediatric Physicians in  
Nigeria: A Phenomenological Case Study**

**By**

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## **Abstract**

Adequate access to and appropriate use of medical evidence by clinicians have been posited as influencing the quality of clinical decisions and outcomes of patient care. The broad aim of this case study of a tertiary hospital was to provide understanding of how the information experiences and practices of paediatric physicians in Nigeria influenced their information practices and the potential implications for patient care.

To achieve the research aim and objectives, a qualitative exploratory study was conducted using multiple sources of data: interviews, diaries, observation and social network chats. Overall, twenty semi-structured interviews were conducted, and seven clinicians provided a week-long information activity self-reports through diaries. Supplementary data were gained via the researcher's personal observation and social media chats with some participants. Paediatricians in the cadre of: Consultants, Senior Registrars, Registrars and Residents provided the data which was analysed using the interpretative method.

The results indicate that the paediatricians' information needs were on: managing challenging cases, supporting diagnostic decisions, managing evolving diseases, managing illnesses in the tropical context, drugs and dosage, refreshing the memory, keeping updated, and passing professional examinations. In general: i) there was haphazard approach to information literacy tuition for the clinicians during professional education resulting in varied information capabilities, and inadequacy of knowledge and skills for good information practice; ii) obtaining medical information from colleagues was the predominant feature of paediatricians' information practices; iii) printed textbooks were the paediatricians preferred source for obtaining medical evidence, however, there was a growing popularity in the use of electronic medical information sources, including at the point of care; iv) a perception of inadequacy of the hospital library services resulted in the paediatricians developing rejection behaviour towards the services, labelled in this study as information service rejection behaviour (ISRB); v) there was general perception by the paediatricians that access to, and use of medical information supports patient care and achievement of better treatment outcomes. This perception instilled a sense of value for information use, demonstrated through the clinicians' dedication to the self-provision of information resources; vi) a dearth of medical resources germane to the contextual management of illnesses led to inadequate clinician knowledge in a good number of cases.

A new model of information behaviour entitled 'the knowledge production (Kpro) model of the paediatricians' information behaviour has been developed from the findings of this study, thereby extending existing scholarly perspectives on people's information behaviour. The Kpro model enunciates the concept of 'knowledge-based information behaviour' (KIB) which was exhibited by the paediatricians.

The study recommends that i) the information literacy skills training (ILST) model developed from the findings, be used as a practical tool for inculcating information literacy to the paediatricians' at the level of residency training; ii) the hospital management/librarians prioritise the improvement of information resources, services and infrastructure e.g. reliable

internet service, e-library at wards and consulting rooms, and clinical librarian services, to enhance good information practices among the clinicians; iii) retraining of the hospital librarians for increased service delivery effectiveness; iv) increased local research through the establishment of Journal Clubs by the paediatricians to enhance local publishing of medical literature.

**Keywords:** paediatric physicians; Kpro model; knowledge-based information behaviour, information literacy skills training (ILST); information resources; information service rejection behaviour (ISRB); Nigeria.

## **Dedication**

To the memories of my father Rev. Emmanuel O. Ibenne and my uncle Moses K. Ibenne who both wished to witness this achievement in their lifetime.

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## **Glossary of Terms**

ACRL	Association of College and Research Libraries
ANZIIL	Australia and New Zealand Information Literacy Framework
BNF	British National Formulary
CD-ROM	Compact Disk Read-Only Memory
CDSS	Clinical Decision Support System
CIT	Critical Incidence Technique
CME	Continuing Medical Education
EBM	Evidence-Based Medicine
EBP	Evidence-Based Practice
ED	Emergency Department
EHCR	Electronic Health Care Records
EHR	Electronic Health Records
eIMCI	Electronic [version of the] Integrated Management of Childhood Illness Protocol
EMR	Electronic Medical Records
EPR	Electronic Patient Records
FMC	Federal Medical Centre
FMOH	Federal Ministry of Health
GDP	Gross Domestic Product
GP	General Practitioner
HINARI	Health InterNetwork Access to Research Initiative
IB	Information Behaviour
ICT	Information and Communications Technology
IL	Information Literacy
ILST	Information Literacy Skills Training model
IRIS	Induction, Research and Information Skills



ISAB	Information Service Adoption Behaviour
ISB	Information Seeking Behaviour
ISHIMR	International Symposium for Health Information Management Research
ISRB	Information Service Rejection Behaviour
KWIC	Keyword-in-context
KIB	Knowledge-Based Information Behaviour
Kpro	Knowledge production model
NHS	National Health Service
NLIP	Nursing Information Literacy Programme
PDA	Personal Digital Assistants
PIB	Paediatricians' Information Behaviour
P-KIB	Paediatricians' Knowledge-Based Information Behaviour
SAILS	Standardised Assessment of Information Literacy Skills
SCONUL	Society of College, National and University Libraries
SMOH	State Ministry of Health
SOM	Stanford School of Medicine
TELI	Technology Enhanced Learning Initiative
UHIN	Uganda Health Information Network

# Chapter one

## Introduction

---

### 1.0 Background to the study

This chapter presents the motivation and context of conducting the research. It outlines the focus and objectives of the research, the expected contributions of the research to literature base and outlines the scope and structure of the thesis.

The physician's possession of competence for appropriate access and use of information is considered a characteristic necessary for coping with the constant changes in present day medical practice (Shanahan, 2007, p. 187). A major factor of the constant changes in the 21<sup>st</sup> century clinical practice is '*an ever-increasing amount of medical information*' produced in diverse formats (D'Alessandro et al., 2004, p. 18). Physicians need to possess the competence for accessing sources of medical evidence, evaluating and applying the knowledge obtained from those sources, for taking the most appropriate clinical decisions (Shanahan, 2007, p. 193; Ford and Hibberd, 2012, p. e42).

There is an ever increasing acceptance in the literature that good clinical practice in present day medicine should be predicated on the use of evidence. Evidence-based medicine (EBM) is defined as '*the integration of best research evidence with clinical expertise and patient values*' (Sackett et al., 2000, p. 1). Evidence-based medicine is also defined as the '*conscientious, explicit and judicious use of the current best evidence in making decisions about the care of patients*' (Sackett et al., 1996, cited in Green et al., 2000, p. 218).

It is believed that physicians are enabled in discharging their professional roles more effectively when they combined personal knowledge with the correct application of medical information (Clarke et al., 2013; Sackett et al., 1996). However, a concern has been raised about clinicians' ability for obtaining and using medical information in a way meaningful for patient care (Forsythe et al., 1992, p. 181). This concern is premised on the notion that: to be efficient in the use of evidence, physicians require a combination of capacity for accessing and making sense of published evidence; and good clinical skills, in order to render appropriate care to patients (McNeil et al., 1999; Mykhalovskiy and Weir, 2003; Swinglehurst, 2005, pp. 198-199).

The use of evidence in patient care implies that '*what practitioners do, and the decisions they make should be based on research evidence of what works, and why it works*' (Urquhart, 2011, p. 39). However the existing barrier is the significant gap between the knowledge and skills physicians obtained from their professional schooling, and ability to engage in appropriate knowledge sourcing, which enables useful application of information in clinical practice (McNeil et al., 1999, p. 52). It appears, therefore, that engaging in evidence-based practice is directly analogous to a physician's information literacy competence. This view is supported by Morley's (2014) description of evidence-based medicine as the corollary of information literacy in health care.

Determining what constitutes the best evidence requires that clinicians possess ability to process the content of medical literature, apply the evidence obtained correctly for patient care, for achieving desirable outcomes (Petrisor et al., 2006, p. 32). As physicians' access and use information for patient care, they encounter challenging situations that require the confluence of personal experience, knowledge and evidence, and are expected to handle specific cases with the best-possible decisions.

This factor highlights the importance of adequate information experience in the ability of the physician not only to access the right sources of information for evidence, but to use it correctly. Physicians require possessing ability for making rational knowledge deductions from medical sources for application to clinical problem solving. Information literacy is the '*necessary foundation*' (Morley, 2014, p. 10) for evidence-based practice. It affords proficiency in knowledge sourcing, knowledge acquisition and adaptation for use, in a quick and efficient manner. It also provides the ability for clinicians to cope with the '*snow-storm*' process (Dawes and Sampson, 2003, p. 9) of knowledge creation and application for patient care.

Information literacy entails the knowledge of how to access, interrogate and use information effectively in problem solving. It is important for physicians to be information literate given that '*information best practices are highly dependent on the context in which individuals find themselves*' (Hoyer, 2011, p. 21). This ability becomes more critical where valid decisions are needed in the specific contexts. It surmises, therefore, that information literacy provides this ability which enables physicians achieve increased effectiveness in patient care.

Some scholars have expressed dissenting views on the use of evidence in patient care, as good clinical practice. Nasr (2010) was prominent among the disapproving views over the growing

acceptance of obtaining and using evidence as defining good clinical practice. To buttress the weakness of engaging in evidence-based practice, Nasr (2010, p. 295) identified the frequent non-publication of '*negative trials*' i.e. trials that yielded negative results, as EBMs '*salient gap*'.

This contrary perspective notwithstanding, majority of the literature attests that the physician's use of evidence to premise decisions on patient care is acknowledged as good clinical practice. Given this scenario, it is important that the information experiences of physicians should be appropriate and relevant, for enabling adequate information literacy to be imbibed. This capability is needed to support information best practices for providing health care; particularly, the ability to deliver evidence-based health care to patients.

## **1.2 Motivation for the research**

The motivation for this study came from the researcher's interest to understand how reports in the literature which assert that healthcare professionals in Africa practice in poor information environment, with limited information capabilities, is true in context of his country, Nigeria. Those reports attributed clinicians' poor information practices to inadequacy of information skills, poor information resources and sundry impediments.

The desire to understand how those claims, were true for paediatric physicians, was heightened by a concern that child population is the highest percentage in Nigeria's demography. The researcher's perceptions of physician decision-making in Nigerian public hospitals, from previous experiences of hospital care, also made him keener to undertake the study.

An initial pre-research literature review revealed scholarly perspective inferring that medical information contributes to the quality of a physician's decisions in patient care. For example, Sackett et al. (1996); D'alessandro et al. (2004); and, Clarke et al. (2013) inferred that obtaining and using medical evidence, contribute to a physician's decision-making and the final outcomes of patient care.

In view of this perspective, paediatricians' use of evidence to support patient care in Nigeria would likely also enhance decisions, resulting in better patient care. Achieving this is important in the Nigerian context, given that child population is the highest percentage at 43.01, and a high rate of child-patient mortality has been reported in the literature in last ten years. Owing to these factors, the researcher felt the need to study the information

experiences and practices of paediatricians in Nigeria, in order to understand how it contributes to their care of patients and its implications.

### 1.3 Background information on Nigeria

Nigeria is a country of multi-ethnic black people, and is geographically located in West Africa, sharing borders on the north with Chad and Niger Republic, on the west with Benin Republic and on the east with Cameroon. Nigeria is bordered by the Atlantic Ocean on its entire southern coastal territories running from Lagos State to Cross-River State.

Present day Nigeria as a sovereign country came into existence in the year 1914, when the then British colonial government amalgamated the Northern and Southern Protectorates under their custody, to form one country. Pre-amalgamation and post-amalgamation Nigeria was colonised under British rule from the late 19<sup>th</sup> Century up till the 1<sup>st</sup> of October 1960 when the country obtained independence from British rule.



Figure 1: Map of the Federal Republic of Nigeria

Source of map: [www.gov.uk](http://www.gov.uk). Retrieved on 05/03/2016

#### 1.3.1 Governance structure of Nigeria

At independence in 1960, Nigeria had a parliamentary system of governance with only three regions; East, North, and West. This later became four regions with the creation of the mid-Western state. In 1967 as a civil war loomed, Nigeria changed to a twelve-state system, and much later after the war, to nineteen states (Olden, 2015).

At present, Nigeria runs a presidential system of government with a three-tier structure consisted of a federal, 36 state, and 768 local governments. Additionally, there is a Federal Capital Territory at Abuja, with 6 area councils; the equivalent of local governments.

### 1.3.2 Demography of Nigeria

With a population of 181, 562, 056 Nigeria is Africa’s most populous country (Central Intelligence Agency, 2013), and the largest black nation in the world (Osazuwa-Peters, 2011, p. 255). According to the Central Intelligence Agency (2013) Nigeria is the eight most populous country in the world, with a life expectancy at birth of 52.46 years. According to Nwogu, Larson and Kim (2008) “*despite Nigeria’s wealth of human and natural resources, it ranks among the 13 poorest countries in the world, as about two of every three Nigerians live below the extreme poverty level of one US Dollar a day*” (p. 161).

The demographic distribution of the Nigerian population in terms of the age structure reveals that with 43.01%, children have the highest population density (see Table 1).

**Table 1: Distribution of age structure in Nigeria**

Age structure	Percentage
0-14 years	43.01
15-24 years	19.38
25-54	30.56
65 years and above	3.11

Source: Central Intelligence Agency, 2013

Nigeria’s age distribution structure as shown in Table 1, weighs heavily towards the young population. This tends to heighten the need to focus energy and policy on the delivery of effective child healthcare, given the ever-present high rate of child mortality indicated by many recent research reports (Adebayo and Fahrmeir, 2005; Nwogu et al., 2008).

This is imperative taking into account the revelation that ‘*Nigeria is one of the least successful of African countries in achieving improvements in child survival during the past four decades*’ (Nwogu et al., 2008, p. 161). The scenario depicted by these authors regarding a long traversing healthcare dilemma in Nigeria, was given credence more than three decades ago by Okafor (1982) who stated that, ‘*Nigeria has one of the highest mortality rates in sub-Saharan Africa with inadequate health care delivery system*’ (p. 18).

### **1.3.3 Healthcare system in Nigeria**

Nigeria's healthcare delivery system has been studied across decades by several authors; Onokerhoraye (1976); Nweke (1995); Ityavyar (1998); Oduwole (1999); Alubo (2001); Hargreaves (2002); Idowu, Ogunbodele and Idowu (2003); Asuzu (2004); Ajuwon (2006); Amaghionye (2008); and Komolafe and Onatola (2008). Reports from these studies were on different aspects of the healthcare delivery, majorly on the effects of systemic inadequacies of the public health sector. The socio-political dimensions of the rise of the private sector-driven health service delivery and the pattern of information use and information behaviour among the medical professionals also attracted the scholars' attention.

Healthcare is provided to Nigerians through various types of hospitals and health clinics in the public sector, and privately-owned hospitals and clinics. The Revised National Health Policy (2004, p. 12) referred to the levels of healthcare provision as primary health care, secondary health care and tertiary health care. The three levels of health administration, namely Local Government Health Departments, State Ministries of Health (SMOH) and the Federal Ministry of Health (FMOH), according to (Ogunbekun, 1991, p. 254), all cater for healthcare delivery at the three levels through policies that govern health care provision. Nigeria's healthcare delivery is a shared responsibility among these three tiers of government, Federal, States and Local Governments (Hargreaves, 2002; Akande, 2004; Asuzu, 2004 and Amaghionye, 2008).

Tertiary health care which consists of highly specialized services is provided by teaching hospitals, Federal Medical Centres and other special hospitals which provide specific care for specific disease conditions or specific group of patients (Federal Republic of Nigeria, The Revised National Health Policy, 2004, p. 12).

Hospital service in Nigeria began in the mid-19<sup>th</sup> Century with missionary hospitals that were established in Lagos and Abeokuta in Southern Nigeria. One of the first known of such hospitals was established by the Roman Catholic Missionaries as the Sacred Heart Hospital in Abeokuta in the 1860s (Egwaikhede et al., 2009, p. 93). The authors stated further that by 1979 there were 562 general hospitals, 16 maternity and paediatric hospitals, 11 armed forces hospitals, 6 teaching hospitals and 3 prison hospitals in Nigeria (p. 93).

Asuzu (2004, p. 1) suggested that the delivery of healthcare in Nigeria went through several phases of reform from what was obtained during the colonial rule. Despite those reforms, the

public health sector in Nigeria remains poor in the present times and faced with depleting resources with which to achieve efficient health care. This factor has made worse the quality of services obtained from the public healthcare services which experiences an ever escalating use by the poor populace (Amaghionye, 2008, p. 15). The year 2000 World Health Report (p. 2) which ranked Nigeria as the 187<sup>th</sup> of the 191 member nations reflects this lack of steady progress in improving healthcare delivery.

The inadequacies of the public healthcare system in Nigeria compounded by deliberate subversion (Ogunbekun et al., 1999, p.177) promoted the rapid rise of the private sector medical care. It appears that *“most Nigerians... have lost faith in government run services, and instead are opting for a burgeoning but largely unregulated private health-care sector”* (Hargreaves, 2002, p. 2032).

These factors of underperformance of the Nigerian public healthcare systems were highlighted in the revised National Health Policy (2004) report which avers that:

“Nigeria’s maternal mortality rate is the highest in the world; some other health status indicators like under-5 and adult mortality rate are higher than the average for sub-Saharan Africa... diagnostic and investigative equipment in tertiary health institutions are outdated (p. 3)”.

UNICEF, Nigeria’s (2014) assessment that Nigeria has a high rate of infant mortality estimated at 2,300 under-five year old deaths per day further amplified these ominous views about the healthcare system. The need for studies into any of the factors contingent to ameliorating this last-mentioned problem becomes more imperative, given the scale of its occurrence.

#### **1.3.4 The research setting: Federal Medical Centre, Umuahia**

The Federal Medical Centre, (former Queen Elizabeth Specialist Hospital) Umuahia, Abia State, a first generation tertiary hospital in Nigeria, was established in 1945 through the joint effort of the Anglican, Methodist and Presbyterian churches. Sir Clement Pleas, representing Queen Elizabeth II, formally commissioned the hospital in 1956 and it has since then risen to the status of a tertiary hospital (<http://www.consumerstell.com/index.php/504-life-a-style/health/hospitals/895-federal-medical-centre>).

The Federal Medical Centre Umuahia is:



“A 327-bed tertiary hospital and one of the leading health care providers in South Eastern Nigeria. The facility is centrally located and readily accessible from Enugu, Imo, Rivers, Ebonyi, Akwa-Ibom and Anambra States. The hospital clients and patients are drawn from all over the country but predominantly from the South East and South-South parts of the country. The hospital environment is clean and ambient. Although established in 1945 as a mission hospital and then named Queen Elizabeth Hospital, it was in 1991 taken over by the Federal Government and renamed Federal Medical Centre, with the mandate to serve the health needs of Nigerians, especially in South East geopolitical zone, particularly residents of Abia State where it is situated....The facility currently boasts of 71 consultants in 26 discipline areas, vibrant residency training programme....FMC Umuahia has the fastest growing Residency Training Programme in Nigeria with record passes in surgery, obstetrics, and gynaecology, radiology, community medicine, family medicine, pediatrics, anesthesiology and internal medicine” (Vanguard News, 2013)

The hospital’s patient admission capacity was upgraded in 2015 with the completion of a new 88 bed ward with 16 private rooms (Vanguard News, 2013). The Federal Medical Centre Umuahia is one of 20 Federal Medical Centres in Nigeria (Federal Ministry of Health, 2015).

#### **1.4 Statement of the problem**

Use of the best possible information by physicians’ has been identified as a critical factor of decision-making by physicians in the management of patients towards increasing the possibility of achieving the most desirable treatment outcomes. To achieve this desirable goal more effectively, physicians need to stay abreast of knowledge, developments and standards of practice within their work contexts. This is considered necessary for taking the best possible decisions during patient care.

There is a widely-held view that present day medical education does not place adequate emphasis on producing physicians who possess the ability to engage in the best information practices that support the use of evidence. This has left an unpleasant gap in physicians’ capability for using information to support decisions in patient care. There is probability of this gap existing in the Nigerian context considering the information problem which plagues Africa; the “*struggle for information and knowledge*” (Sturges and Neil 1998, pp. 1-2). Ten years after Sturges and Neil (1998), Tihamiyu and Aina (2008, p. 3) inferred that sub-Saharan Africa to which Nigeria belong, remained rudimentary in developing the information capabilities of its human capital, particularly evident in the use of digital information infrastructure.

The information capacity gap potentially generated by this scenario for clinicians, could limit their overall effectiveness in patient care and self-development. This perhaps poses a greater child health care problem for Nigeria which is among the countries that have continued over the last decades to experience high rate of child mortality. Authors such as Black et al. (2010, p. 1976); Liu et al. (2012, p. 2152); and Requejo et al. (2014, p. 590) have attributed majority of these mortalities to preventable and treatable diseases.

It is believed that information contributes to a clinician's effective treatment of patients and that a physician's shortfalls in information literacy may induce shortcomings in good information practices towards effective patient care (Clarke et al., 2013).

To date, no studies have shown the typical information experiences of Nigerian paediatric physicians' either pre or post-qualification, and their information practices during patient care. This gap remains even when it is obvious that physicians are very central to the provision of effective child healthcare in any system.

This study provides understanding of the information experiences and practices of Nigerian paediatric physicians. Consequently, it highlights potential implications this has for delivery of appropriate child health care.

## **1.5 Research aim and objectives**

### **1.5.1 The study aim**

The study aims to provide an understanding of the information experiences of paediatric physicians in Nigeria and their information practices for patient care.

### **1.5.2 The study objectives**

The specific objectives of the study were to provide understanding of:

- the physicians' awareness, perception and experience of information literacy for patient care;
- the influence of the physicians' information experiences on information practices for patient care;
- inhibitors to the physicians' information experiences and information practices for patient care;
- the potential implications of the physicians' information practices for providing care to patients.

## **1.6 Research Questions**

The research questions for this study were:

1. What information experiences do paediatric physicians in Nigeria have?
2. In what ways do paediatric physicians in Nigeria engage in information practices towards patient care?
3. Does the paediatricians' information experience have implications for their information practices and patient care?

## **1.7 Scope of the study**

The study provides understanding the information experiences and practices of paediatric physicians in Nigeria with regard to their professional roles. This exploratory research is a phenomenological case study of one tertiary hospital in South-eastern Nigeria.

## **1.8 Originality and significance of the study**

This unique first study of paediatric physicians' information experiences and practices in Nigeria provides primary information, for gaining understanding about this previously unknown phenomenon in that context. Providing this understanding is deemed important for initiating and implementing interventions capable of enhancing the delivery of better care to paediatric patients, and the professional development of the paediatricians.

This study is original given that it is the first study in the Nigerian context, focusing on the information experiences and practices of paediatric physicians. The literature review shows that in general, the information needs, experiences and practices of paediatric physicians in Nigeria has not been previously researched. Consequently, knowledge about the information experiences and practices of paediatricians in Nigeria is non-existent. This is in spite of Nigeria being a middle-income developing nation with a fast growing population in need of appropriate healthcare for all.

Previous studies have, however, been conducted on the information behaviour of other health care professionals in Nigeria, including that of physicians in various specialties of medicine. For example, Ajuwon (2006); Komolafe and Onatola (2008); Osiobe (1985); Oduwole (1999); Nweke (1995) and Baro (2013) have all given reports about the information behaviour of health care professionals in Nigeria. However, none of these studies explored how the objects

of their study acquired the information capabilities and how those capabilities exert influence on the reported information behaviour.

Outside the Nigerian context, studies such as Salman, Ahmed and Khan (2013), Masters (2008a, 2008b) and Peterson-Clarke, Aslani and Williams (2010) reporting studies in Pakistan, South Africa and Australia respectively, had a similar gap in emphasis. This mirrors a universal dearth of emphasis on the influence of information experiences of health care professionals on their information practices. The information behaviour reported in these previous studies focused more on the resources used by the health care professionals without investigation the in-practice application, rationale and outcomes of the information use process.

The scarcity of previous knowledge on the topic makes the study also exploratory in form. Exploratory studies are conducted in a context where little knowledge about the matter investigated is available. Techniques such as conversing with professionals in the field, participant observation, and in-depth interviewing are used in exploratory studies to gain understanding of a matter about which little previously was known (Gray, 2004; and, Gorman and Clayton, 2005). Findings from exploratory studies are considered useful for deciding on measures necessary to improve on the limitations identified about the object studied. The results and mediatory actions could be transferable to other similar cases, and could also inform the necessity for more research.

## **1.9 Definition of terms**

These terms are defined in the context of their use in this research and may differ from their common meaning and usage.

**Information Literacy (IL):** The ability to recognise the need for information, the multi-modal means of locating and evaluating information, and the effective use of new knowledge received from processed information to enhance practice. This ability is part of a continuous learning and improvement process by the paediatricians in their community of practice.

**Information Practice:** The practical application of information skills and knowledge to access and use information appropriately in order to achieve effectiveness of patient care and professional development.

**Information experience:** The various ways through which the paediatricians acquire competence for good information practice or their experience of an information service.

**Information Literacy Skills:** The various skills and competencies needed for effective practice of information literacy, particularly those influencing knowledge-sourcing and its practical use outcomes.

**Knowledge:** The awareness of, and/or understanding of ideas, concepts, methods, subjects and facts, acquired by the paediatricians' in relation to their professional roles, through exposure to different types of information experiences.

**Physicians, Clinicians, Paediatricians, Doctors:** These terms are used interchangeably to refer to professionally qualified paediatric doctors from the cadre of registrar to consultants working at the studied hospital.

## **1.10 Structure of the thesis**

### **Chapter 2 Literature Review**

A review of relevant literature is given in chapter two. This is considered useful for laying a conceptual foundation for the conduct of this study, and establishing the specific gap in the literature base, which this study aims to contribute to closing.

### **Chapter 3 Methodology**

The methodology for this study is explained in detail in Chapter 3. The chapter explains: the philosophical assumptions of the study; the methods intended to be used for conducting the study; and, how the data obtained will be analysed, presented and interpreted.

### **Chapter 4 Analysis of interview data**

An interpretative analysis of the data collected from the interviews with the paediatricians is given in chapter 4 of this study.

### **Chapter 5 Analysis of Participant Diaries**

An interpretative analysis of the data collected from the diary records by the paediatricians is given in chapter 5 of this study.

### **Chapter 6 Discussion**

In chapter 6, a discussion of the findings of this study is provided. The discussion aims to establish the implications of the findings of the study. Discussing the results will also

establish whether this study contrasts with, compares to, deviates from, or extends what is already known in this field, as contained in the existing literature base.

## **Chapter 7    Conclusions and Recommendations**

This chapter draws conclusions on the study as to: i) whether the aim and objectives were met; ii) whether the research questions were adequately answered; and, iii) what the unique contributions of this study to the literature base are.

Finally, Specific recommendations based on the findings, are made in respect of actionable issues identified from this study, and recommendations for future research.

# Chapter two

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## Literature Review

### 2.1 Introduction

Having explained the context, motivation, aim and objectives of this research in chapter one, a review of literature was done in this chapter in order to identify existing scholarly perspectives and the gaps which make this study relevant. To achieve this objective the review analysed literature related to the research topic as means to understanding the worldviews in other studies, context of those studies, the approaches used and the results obtained.

The review also contributed to guiding the choice of method for placing this research within an analytical context through adoption of a philosophical basis and research methods, as discussed in chapter three. It further contributed to the modifications made on the objectives and research questions initially proposed for this study in chapter one.

### 2.2 The information literacy concept

As a concept, information literacy (IL) became popular in the last three decades. The concept was first introduced by *Zurkowski (1974) [who] first coined the term information literacy as a way of describing the information skills that would be required of service workers in the information age* (Lloyd, 2010a, p. 60). Discourses on the meaning and applications of information literacy since then had elicited several perspectives with no universally accepted definition to date. This is owing to differences in philosophical leanings of scholars interested in the subject. There is however, an increasing convergence around the perspectives held by the Australian and New Zealand Information Literacy Framework (ANZIIL) (2004), the Association of College and Research Libraries (ACRL) of the American Library Association (ALA) (2000) and SCONUL's (2011) Seven Pillars of Information Literacy.

The Australian and New Zealand Information Literacy Framework (2004) established six standards of IL practice predicated on four principles which suggest that information literate people should be able to:

- Engage in independent learning through constructing new meaning, understanding and knowledge,
- Derive satisfaction and personal fulfilment from using information wisely,
- Individually and collectively search for and use information for decision making and problem solving in order to address personal, professional and societal issues,
- Demonstrate social responsibility through a commitment to lifelong learning and community participation (p. 11).

The six core standards framed by the document enumerate that the information literate person:

- Recognises the need for information and determines the nature and extent of the information needed
- Finds needed information effectively and efficiently
- Critically evaluates information and the information seeking process
- Manages information collected or generated
- Applies prior and new information to construct new concepts or create new understandings
- Uses information with understanding and acknowledges cultural, ethical, economic, legal and social issues surrounding the use of information (p. 11).

Similarly, the Association of College and Research Libraries (2000) prescribed five core competency standards, with performance indicators and outcomes which were similar to ANZIIL. ANZIIL's document proposed an assessment model for IL curriculum alignment as a *'way for students and educators to come to a common understanding about learning outcomes and expectations'* (p. 25) which emphasises objectives, content, teaching methods teaching, learning activities and learning outcomes as basis for assessment and evaluation.

IFLA/ALP views information literacy as a self-empowering attitude and a commitment by individuals to seek access, analyse, translate, transform information and create knowledge for problem solving and for achieving personal, social, learning and occupational goals (IFLA/ALP, 2007). Over time, it has become increasingly evident that the 21<sup>st</sup> century will be governed by the creation and use of information in all careers (Ojedokun, 2007). This raises the necessity for physicians to develop information literacy capacity that supports evidence-based practice in their field. This is an integral part of effective health care delivery to patients.

Ojedokun (2007) characterises information literacy as a prerequisite of the modern information society that is based on intelligent identification, location, perception, appraisal



and usage of information and for lifelong learning. Information literacy is perceived as a disposition to the value of information, which is expressed through purposeful access to appropriate information sources for acquiring knowledge.

Lloyd (2010a) perceives information literacy as a socio-cultural practice and a type of learning that occurs within a situated context facilitated by and defined within the ambit of social interactions. Learning in this fashion transcends people's acquisition of operational skills of information search, to their acquiring capability for practical, manoeuvrable application of information in their everyday roles within a social setting (pp. 24 &104).

### **2.3 Different perspectives on information literacy learning**

There are two major perspectives on how people acquire information literacy competencies. These perspectives are discussed as follows:

#### **2.3.1 Library-centred perspective of information literacy learning**

Some scholars infer that the library is the primary agency through which people develop information literacy. Some of the authors who propose this perspective that libraries and librarians are best placed to lead the process of promoting information literacy skills are Welsh and Wright (2010); Burke (2010); and, Andretta (2005). These authors hold that information literacy capacity development centres on bibliographic-instruction provided by libraries to its users. In their view this enables people become skilled users of information for life-long learning. A slightly different perspective provided by Shih (2012) infers that *'a successful information literacy education requires collaborative efforts from stakeholders including librarians, information technologists, faculty members, and media specialists'* (p. 285).

A contrast to overarching view of information literacy development from a library-based skills and instruction perspective was challenged by Wilder (2005) who disapprove library-based information literacy tuition as *"trying to make ... [people] into librarians"* instead of making them proficient for life-long learning (cited in Godwin and Parker, 2012, p. 21). Bawden (2001) provided the perspective that in the debate there can be no widely shared conclusions owing to the difficulty in determining who makes the most contributions to the process of people acquiring and practicing information literacy (Bawden (2001) cited in Andretta (2005, p. 11)).

Under the library centred perspective of developing information literacy, librarians have universally promoted skills instruction as the primary route to people becoming information literate. In line with this perspective, many institutions and organizations have developed librarian-led information literacy instructions tailored towards the specific learning contexts of their students and staff.

There is an ongoing debate as to whether information literacy programmes centred on skills acquisition adequately prepare students for a '*purposeful, successful, interaction with the world around them*' (Hepworth and Walton, 2009, p. 27) on graduation. Horton (2011) emphasised that information literacy tutors in all contexts should concentrate on linking information literacy to specific long-standing goals. Specifically, they demanded that trainers should make the body of knowledge and skills acquired through information literacy relevant for application to the modern Global Information/Knowledge Society in all contexts (pp. 262 & 273).

Due to the lack of universality of understanding the concept, many information literacy tuition curriculums lacked a framework for an objective skills assessment until recently (Gross and Latham, 2012). This was despite the longstanding interest in the subject at many institutions. This scenario was orchestrated by the lack of understanding about what the information literacy skills to be measured were.

In the absence of a lack of uniform standards for assessing information literacy skills, many institutions developed customised guidelines for instruction and assessment of those skills. For example, the Kent State University developed the Standardised Assessment of Information Literacy Skills (SAILS), (Rumble and Noe, 2009). Similarly, Cambridge University developed the Induction, Research and Information Skills (IRIS) to map information skills training and support provided by their libraries against the information seeking strategies and perceptions of students (Kuhn and Edwards-Waller, 2009, p. 253). Maggio and Posley (2011) reveal that an interactive information literacy curriculum which was librarian-medical doctor led was implemented at the Lane Medical Library of Stanford University School of Medicine (SOM). The authors inferred that information literacy sessions included opportunities for students to receive feedback about their skills during practice (p. 259).

At the Southern Connecticut State University the Web CT campus Edition (Web CT/CE) was used to deliver online information literacy instruction to students alongside the Nursing Information Literacy Programme (NILP) (Florea, 2008, pp. 411-412). Jiyane and Onyanha (2010 p. 13) reported the information literacy skills instruction and assessment programmes established in South Africa by universities and the government. Such programmes include the INFOLIT in 1995, the Cape Library Cooperative Project in 1992, the LINK centre at the University of Witwatersrand, and the TELI (Technology Enhanced Learning Initiative).

These programmes indicate the global nature of the acceptance of the value of information literacy for the development of lifelong learning skills in education and other environments.

### **2.3.2 Social constructivist perspective of information literacy learning**

Social constructivists reflect on information literacy as common to and situated in all disciplines, learning environments and levels of education. They disagree with the perspective that becoming information literate can only follow formal skills instruction training. Lloyd (2010a) and Hepworth and Walton (2013) are some of the scholars who hold this perspective. Hepworth and Walton (2013) specifically argue that the concept of information literacy is increasingly being taken out of the traditional educational or library context and into the workplace that now emphasise the individual's attitudes and capabilities in managing, organizing, sharing information and knowledge in the organization.

Lonka (2012) aligns with this side of the debate by stating that:

“learning always takes place in a context which is situational, but relies on culturally and historically developed structures, and that human beings have evolved in such a way that their normal cognitive development depends on a certain kind of cultural environment for its realization” (p. 15).

This perspective also takes the emphasis away from skills instruction to a more social interactionist model of learning for the development of information literacy by individuals. The concept promotes people's active participation within a social context as means for acquiring information skills relevant for real-life application to problem-solving.

Information literacy under this model entails an unstructured learning. This learning affords a person within a social community, the ability to be able to effectively engage with and utilise

the information sources and resources within that community, for satisfying given information needs. Lloyd (2010 a) underlined the argument of this perspective when stating that:

“information literacy is a practice that is construed through a constellation of affordances, information activities and skills, which together enable a way of knowing the modalities of information that constitute an information environment” (p. 168).

This view of information literacy as a situated learning has progressively been canvassed with its apologists continuing to increase in the literature such as Hoyer (2011) who believes that:

“an information literacy instruction model that emphasises the use of specific tools and the acquisition of a set of skills will not be adequate in a setting where social relationships are important for finding and evaluating information” (p. 12).

Hoyer’s further view that ‘*social relationships*’ were ‘*important for finding and evaluating information*’ (p. 12) set the tone for the debate that challenges the notion of the primacy and exclusivity of skills instruction method for making people become information literate. This perspective asserts the equality of social relationships and skills instruction in people’s development of information literacy capabilities.

Additionally, social constructivists view learning as a continuous process that requires both mentoring and communal knowledge sharing in situated learning context to be maximised.

The situated learning concept is seen as:

“an idea that is closely linked to learning by doing and reflection, in a process of apprenticeship with its four key aspects as: participating in communities of practice; acquiring professional identity; learning by doing and evaluation through practice” (Kvale (1997) cited by Torras and Saetre (2009 p. 81)).

This social participation affords the individual opportunity for information sharing and for the conception of new knowledge. It underscores the perspective that information literacy surpasses an individual’s possession of mainly a set of transferable skills, particularly those that are educationally related and taught in librarian-led information literacy instructions.

Whitworth (2009) concurs with this perspective when stating that ‘*the information literate person is not just a conduit of information, but is actively using it and enhancing it, for their own benefit*’ (p. 96). Whitworth’s assertion implies that information literacy can only be

usefully demonstrated within a problem-solving context related to the correct use of information.

Lloyd (2010 a) asserts that information literacy is '*a socio-cultural practice*' that extends beyond mere ability to acquire a set of skills to a complex understanding of the social modalities that influence the learning and application of information in specific contexts (p. 24). Mutch (1997, p. 380) similarly argues that information literacy is sensitive to context and is a continuum of learning where individuals do not necessarily need the same skills.

The underlying assumption in in this perspective is that information literacy is a learned practice. This learning occurs within different types of settings and in different situations. As an ingrained ability displayed in practice and everyday life, IL reflects a contiguous part of the routines of people living in the society displayed in several ways. Information literacy supports the individual's effectiveness in the completion of real-life tasks.

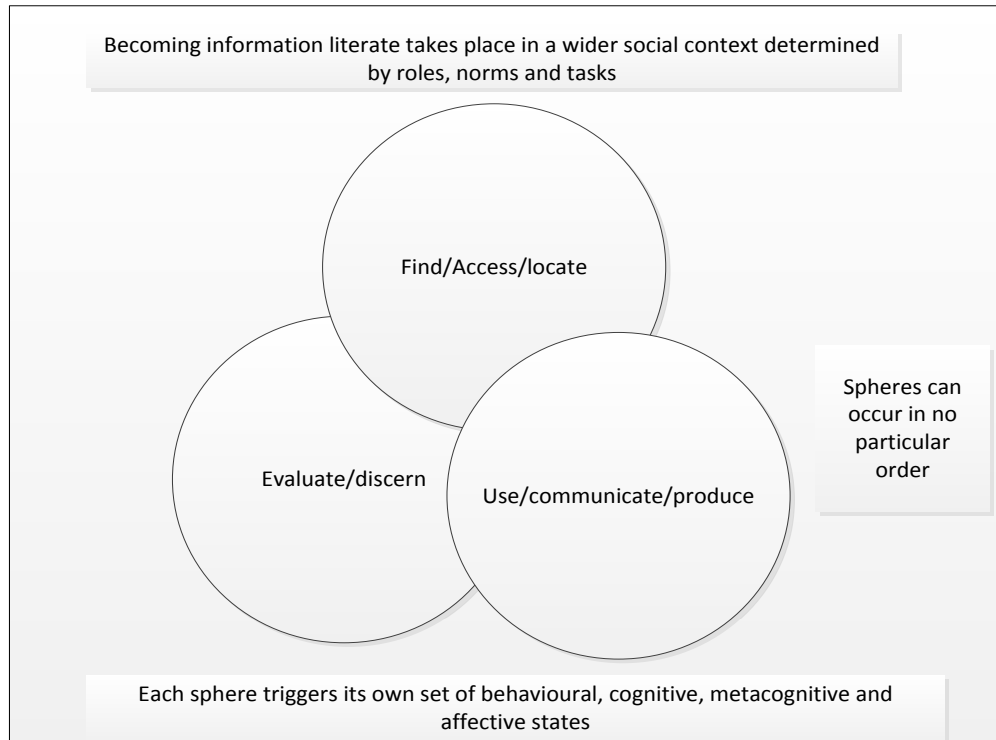
The synopsis of this perspective is that information literacy capability may not be adequately demonstrated by people who possess limited set of skills applicable in specified contexts. The social constructivists infer that people become information literate through multiple different engagements within their social environment. What they consider essential is not the means through which a person becomes information literate, but the ability to both apply information literacy capabilities to problem solving and adaptation to other contexts of information need.

#### **2.4 Models of the information literacy learning process**

Becoming information literate as discussed earlier is a process shaped by multiple factors, social and cognitive, defined and applied within specific contexts. It appears universally recognised that the evidence of information literacy is people's demonstration of ability to navigate the information maze of their environment constructively for problem solving purposes.

The debate about the best means to achieve this capability continues in the literature. This debate and diversity of views has resulted in scholars developing multiple models to demonstrate how information literacy is learnt. Every model tends to explicate information literacy learning from different perspectives and applicable more relevantly in different contexts.

Walton and Cleland (2013, p. 23) developed the three sphere model of information literacy that explains how individuals become information literate in the wider social context. This is as shown in figure 2.



**Figure 2: Three sphere model of information literacy, Walton and Cleland (2013, p. 23)**

Walton and Cleland explain that each sphere in the model is intertwined with each other, contributing to the entire process of learning, although learning occurs in no particular order. The authors explain further that variations occur in the degree of importance of each domain at certain points during the process. What is implied in Walton and Cleland's model is that there is no singular approach that best explains the information literacy concept. It portrays the information literacy learning as an interconnected process that impacts on the individual's capacity to be a lifelong learner.

Another information literacy learning model by Hepworth (2000) addresses information literacy learning more specifically within the educational context. The model conceives information literacy as both '*the skills and attitudes relating to the generation, use and communication of data, information and knowledge*' (p. 23). In the model, Hepworth proposed the following to demonstrate the key areas of learning in information literacy:

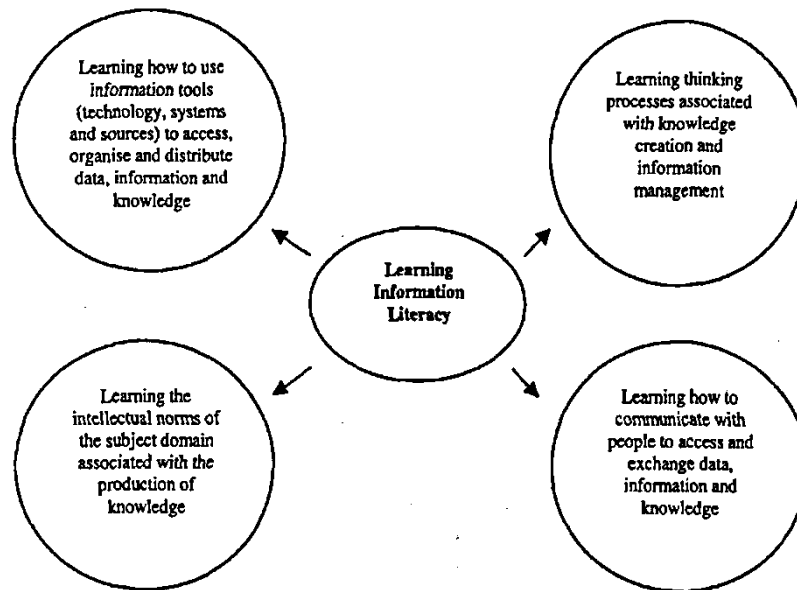


Figure 3: Key areas of learning information literacy, Hepworth (2000, p. 24)

Hepworth explains that in the model, learning how to use information tools (circle top left), includes learning the purpose and functionality of ICT and also the use and navigation of physical information media. In the second domain (circle top right), learning the intellectual process concerns knowledge creation and information management. The third concept, learning how to communicate (circle down right) includes the interpersonal skills associated with effective gathering and exchange of information and knowledge (i.e. team work, negotiation, listening, collaboration and training) which works in conjunction with appropriate communication styles. The last in the process is learning the intellectual norms (circle down left) of the subject domain, depending on the nature of the subject matter.

Hepworth's model connotes that the information literate individual operates in a balanced and integrated knowledge base. This balance results from interactions with different knowledge domains in the learning process, for understanding the theoretical and practical implications of information use. Information literacy from this perspective surpasses the bibliographic instruction to suggest that the influences of other learning domains are correspondingly useful in its learning process.

In Hepworth's (2000) model, the information literacy process is conceived as a combination of various strands of impact. These impacts are the cognitive, behavioural, cultural and social factors on an individual in shaping an information capability.

## **2.5 Competencies needed for effective information literacy practice**

Three major competencies have been identified as defining people's appropriate practice of information literacy. These are discussed as follows:

### **2.5.1 Bibliographic search skills**

One of the requirements that have been canvassed for of an information literate person is the ability to use basic skills for information search (bibliographic search competence) in the process of information discovery and use. Welsh and Wright (2010) believe that a person's possession of some basic information search skills is essential for an effective information literacy practice. Some of those required skills were identified by Bruce (2002) as: *'task definition; the development of information-seeking strategies; locating and accessing information; synthesizing and evaluating information; and, using information'*.

The NHS Education for Scotland (no date) aggregated the skills needed for effective practice of information literacy as the individual: being able to articulate a question for a felt information need; being aware of how information is organised and distributed in diverse formats; being able to discover and access a variety of possible sources of information - people, print and digital. The authors inferred further that these skills enable people to locate information more accurately, by affording ability for employing a search strategy to refine probes, which enhances specificity of information retrieval in a search.

The possession of these skills is imperative due to the perception that *'components tied to creativity'* such as; *'decision making, strategic thinking, critical thinking, and problem solving ought to form the core of individual information literacy'* (Lantz and Brage, 2014, n.p.). Specifically, this is reflected in the application of information capability as a practical tool for problem-solving in personal, social and workplace contexts.

### **2.5.2 Information and Communication Technology use skills**

Information and communication technology (ICT) has been recognised as increasingly central to information use, and pivotal to information literacy practice.

One of the most important of these skills is proficiency in the use of the internet. As Rastgoo et al. (2011) reckons, internet information literacy skills, is a distinct skill-set of information literacy necessary for individuals to possess to be effective learners. This perspective mirrors an existence of connections between online learning and the information literacy of people



(Mackey and Jacobson, 2011, p. xvii). In recognition of the role of the internet in fostering information literacy Click and Petit (2010); Luo (2009) and Fernandez-Villavicencio (2010) advocate the integration of Web 2.0 and social networking tools in helping people become information literate in a digital and network-based society. Expressing a similar view, Burke (2010) states that:

“Currently, the need for information literacy skills is the most pressing global issue ... Overcoming and adapting to the challenges of the technological age is and will be the most significant transition in our lifetime, and possibly even all of history. ... Everyone around the world is impacted by the challenges of technological age and must learn to adapt and cope by learning information literacy skills” (p. 248).

Jacobs, et al. (2003) outlined the multi-dimensional aspects needed for applying ICT skills in information literacy practice. The authors infer that this surpasses mere computer literacy and internet skills and encompasses the need for the development of ‘*capacity to choose appropriate technologic tools to obtain information*’ (p. 321). Overall, the possession of ICT proficiency increases people’s ability to manipulate technological information sources. Then again, people’s information literacy proficiency enables them to make good choices about their information sources and the means of identifying and accessing information.

### **2.5.3 Communication and Social interaction skills**

In the field of medical practice, many recent studies have emphasised the centrality of interpersonal interaction skills in the information capability of clinicians for effective communication, data gathering, information sharing and counselling (Hook and Pfeifer, 2007; Duffy et al., 2004; Zanten et al., 2007; Hobgood et al., 2002; Dulmen et al., 2000).

According to Zanten et al. (2007) overall clinician competence is adjudged by the possession of some competences including communication and interpersonal skills and effective information gathering skills. Effective communication and interpersonal interaction skills are particularly essential for clinicians’ information use proficiency in the emergency care environment (Hobgood et al., 2002). In a study of clinician interpersonal skills, Donnelly et al. (2000) discovered that there was a strong relationship between clinicians’ interpersonal skills and their competence and level of training (p. S93), all of which affect the quality of clinician information use in patient care.

This finding, among several others highlights the necessity for curriculum changes to trainee clinician programmes in order to incorporate development of interpersonal information skills. Hobgood et al. (2002) and Duffy et al. (2004) encouraged medical schools and their accreditation bodies to focus methodology and assessment on trainee physicians' development of this competence. This factor owes to these skills being necessary for effective clinical practice and information use by clinicians.

Dulmen and Holl (2000) buttressed the imperative of introducing these methodology changes specifically for the training of paediatric physicians. The authors stated that: '*Paediatric care places great demands on interpersonal communication skills*' (p. 489). The undergirding argument in the literature is that the possession of these skills aids the clinician to be effective in obtaining and giving oral information in the discharge of routine clinical duties.

## **2.6 General usefulness of information literacy**

The prevalent perspective of information literacy situates the concept as a learned ability that translates to people possessing lifelong capacity to solve information-related problems. This capacity affords people the skills to adapt in society and to elicit knowledge from their information environments. The knowledge acquired is applied to problem-solving and for plausible decision-making in different circumstances (Lloyd 2010a, 2010b; Walton and Cleland, 2013; Bruce, 1999). Becoming information literate is a process that leads to empowerment of the individual to take rationally elevated decisions in information use and knowledge application. According to Secker and Coonan (2013):

“Information literate people are discerning in their choice of information sources and their use of knowledge; they are judicious citizens who can use information to transform their circumstances, create new knowledge and reach their full potentials” (p. xv).

Walton and Cleland (2013) similarly outlined the usefulness of people becoming information literate:

Becoming information literate appears to be about an individual completing a task in a given context (this context frames their roles and norms, e.g. a student required to complete an assignment). This context leads to the interaction with sources (e.g. databases, e-journals, books, e-books, peers, tutors and other individuals) and in so doing brings about the interplay of an individual's behavioural, cognitive, metacognitive and affective states. It is this interplay that determines the level of new knowledge learnt (or produced, or both) and the degree of changed behaviour (i.e. level of information literacy exhibited) (p. 23)

Information literacy is predominantly perceived presently as a context-shaped and context-defined ability. This ability relates to people being able to find, access, modify or transform information when necessary, for use in real-life problem solving. Within this perspective, the concept of information literacy is progressively embedded as integral to all environments, among which is the workplace setting. The Alexandria Proclamation on Information Literacy and Lifelong Learning echoes the workplace relevance perspective of information literacy:

“Information literacy lies at core of lifelong learning. It empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion of all nations” (IFLA, 2005, p. 1).

It has been argued that a necessity for individuals to effectively achieve these goals is for them to not only be information literate, but to ably apply it perceptibly in solving defined problems. Lloyd (2003) refers to this multi-context ability to apply information literacy as ‘*meta-competency*’ (p. 90). The meta-competency perspective infers that:

“an individual can competently and independently recognize the nature of the information need and navigate the complex information pathways that exist in the workplace environment. This view also insists that the individual is able actively to navigate cognitive and environmental barriers, and to accommodate and assimilate information in the creation of new knowledge, or the search for solutions to novel situations” (p. 90).

The application of information literacy by individuals is therefore the platform to actively elicit useful information from the overwhelming world of data. This owes to the fact that information and knowledge are rapidly being produced and delivered in an ever changing landscape potentiated by advances in the use of modern technology. Hepworth (2000) posits that information literacy is necessary because we live in a changing world of ‘*information intensive economies*’ where the greater emphasis and attention is being paid to ‘*improving the intellectual processes associated with data, information and knowledge management in the workplace*’ (p. 22).

Similarly, Freeman and Lynd-Balta (2010); Grafstein (2002); Dunn (2002); and Foster (2009) view information literacy as necessary in multiple contexts. It fosters the development of a successful educational career for students and in the wider social context it promotes future

best practices in the workplace and enables people to derive fulfilment in their day to day personal lifestyles. Dokphrom (2013) and Williams (2005) consider the attributes of an information literate as connoting an individual who has been enabled with a broader proficiency for a successful and beneficial use of information across many tasks.

It has been argued that realising the need for information is a part of the competence exhibited by an information literate person (Welsh and Wright, 2010). Information need is construed as a gap in people's knowledge which needs positive encounter with information to fill. This information need happens where people recognise the existence of such gap in their state of knowledge and where this is considered abnormal (Nicholas and Herman, 2009, citing Belkin and Vickery, 1989).

Sohn et al. (2008) averred that people use a variety of strategies to obtain desired information depending on the importance of the information need, and the amount of time available. The strategies used are however, mediated by the information literacy capabilities of the individuals. Case (2007) citing Dervin (1983) infers that information need implies:

“a state that arises within a person, suggesting some kind of gap that requires filling. When applied to the word information, as in information need, what is suggested is a gap that can be filled by something the needing person calls ‘information’” (p. 75).

The understanding that a person needs information to fill an information or knowledge gap triggers information-seeking, which in itself:

“takes place 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. It can also take place when a person recognises a gap in their knowledge that may motivate that person to acquire new information” (Zerbinos, 1990, p. 922).

People's quest to satisfy their information need tend to be the most identifiable starting point in the process of information search. Information search is conducted from various sources using different channels and based on individual preferences, general information behaviour and their information literacy capability. Hughes, et al. (2010) posits information search as a process by which a person seeks knowledge about a problem or situation. In this process of information search, an information literate person frames a suitable search question for obtaining information from the right sources in a search process. This is in addition to

possessing the competence to elicit new knowledge from interaction with the obtained sources of information.

Gorman and Dorner (2006, p. 4) cited Norgaard (2004) to caution on an over-emphasis on functional skills in relation to the practice of information literacy. Norgaard suggests that *'instead of these merely functional skills, we should see information literacy as learning how to integrate and evaluate information in complex situations'* (p. 221). In general, information literacy should continuously provide individuals with ability to employ information skills acquired through diverse methods, for obtaining information useful for problem-solving in the learning, social and workplace environments.

Information literacy is therefore the catalyst that produces the effective individual who fits with his/her role expectations in the workplace and in society. Conversely this implies that people cannot effectively discharge of their work-roles in the modern workplace, if they do not possess adequate capability for a good information literacy practice.

## **2.7 People's information behaviour in relation to their information literacy**

Authors in information behaviour such as Line (1998) share a common view that people have different experiences in diverse information-seeking environments and contexts, and use the information they obtain in different ways. The individuals' information behaviour is influenced by factors such as the situation prompting the need, and other social and personal circumstances (Wilson, 1997, 1999; Spink, 1997; Sonnewald and Livonen, 1999). The majority of views as shown in the different models presented in this study suggest that a common denominator in people's information behaviour is primarily their information needs. Information needs were conversely portrayed as being necessitated by people's work and social roles.

Information behaviour was defined simply as how people behave towards information (Mutshewa, 2007; Salman et al., 2013). Information behaviour predisposes the individual's inclination in the practice of information-seeking in exercise of information literacy. The behaviour reflects in *'those activities a person may engage in when identifying his or her own needs for information, searching for such information in any way, and using or transferring that information'* (Wilson, 1999, cited by Detlor, 2003, p. 114).

A contrasting but not very popular perspective suggests that some factors cause people to avoid information regardless of their information needs. Nicholas and Herman (2009) who proposed this perspective of information avoidance in people's information behaviour stated that:

'Clearly, in today's internet-based information world, in which information is being generated in ever-increasing volumes and people are connected to information sources of unparalleled power and reach, taking a conscious decision not to attempt to meet one's information needs, at least not fully, is commonplace and will increasingly become more so' (p. 19).

Although this view is not popularly accepted among information behaviour scholars, it appears to be in consonance with the notion that availability of information must be matched by people's competence and knowledge in engaging constructively with the appropriate sources. It has been also argued that '*whether or not [people's] information needs are pursued depends on the individual's ability to identify their need and then to express the need in terms that are searchable by themselves or a third party*' (Lor, 1979, cited by Davies and Harrison, 2007, p. 84).

In the practice of information literacy, information behaviour is perceived as exacting influence on peoples' information seeking. People's information behaviour is characterised or shaped by the value that individuals attach to information (Mutsheva, 2007; Salman et al., 2013). Individuals also operate within cultural spheres that shape those values and dispositions to information. Hepworth and Walton (2009) define culture as a concept that '*encompasses the wider set of ideas, attitudes and norms that tend to influence people's information behaviour*' (p. 118).

Within this cultural environment, people develop awareness related to specific information needs and the desire to satisfy those needs. The defining characteristic of this cultural environment is that:

"information literate people will demonstrate an awareness of how they gather, use, manage, synthesise and create information and data in an ethical manner and will have the information skills to do so effectively" (SCONUL, 2011, p. 3).

The tendency for individuals to avoid information in their cultural environment can therefore only be the resultant effect of non-possession of adequate information skills for information access and utilization.

### **2.7.1 Other factors affecting people's information behaviour**

Information behaviour is underpinned by a person's approach to learning which encompasses: *'the intention to understand or reproduce, the focus on the task or learning material itself, or its underlying purpose'* (Dall'Alba, 2000, cited by Diehm and Lupton, 2012, p. 217). This perspective echoes the belief that people behave differently in the same information environment based on certain mediating factors.

The information behaviour discourse elicits divergent perspectives among scholars of different divides in ideology: psychological and sociological (nature versus nurture debate in information behaviour). This makes *'epistemological uncertainty a characteristic of information behaviour research'* because of the lack of agreement on methods and interpretations (Urquhart, 2011, p. 38). Authors in the psychological divide advocate basically the primacy of cognitive learning in determining people's information behaviour.

The authors in the sociological divide believe in the primacy of the socio-cultural system in influencing the information behaviour of people (Lloyd, 2010a, 2010b; Hoyer, 2011). In this perspective the process of interaction within a community, workplace and other affordances help the individual to shape a worldview about information and information practices.

It has also been argued that differences in the information behaviour of people are influenced by a variety of factors including: age, gender, socioeconomic status; role; educational level and occupation and also due to personality factors, learning and thinking styles (Bawden and Robinson, 2011, p. 128). Besides these factors:

“Information behaviour is simultaneously shaped by immediate influences, such as friends, family and other trusted small world sources, and by larger social influences, including public sphere institutions, media, technology and politics. Information behaviours of all sorts are situated and contextualised, [and] given meaning by the multi-tiered contexts within which they occur” (Burnett and Jaeger, 2011, p. 162).

The views expressed by these authors indicate that peoples' information practices are expressions of their information behaviour. According to Line (1998) *'all people are*

*individuals, and will seek and use information in different ways'* (p. 223) although there are some generic factors considered to exact influence on the information behaviour of individuals. These factors include: environmental, cognitive, affective and social factors (Allen, 2011; Niu and Hemminger, 2012).

Niu and Hemminger examined the effect of user attributes and environmental context factors on the information-seeking behaviour (ISB) of scientists and identified demographic, psychological, role-related factors as affecting their ISB. Role-related factors were identified as the most important determinant of people's information seeking behaviour.

The model in Fig. 4 was designed by Niu and Hemminger (2012) in support of their argument:

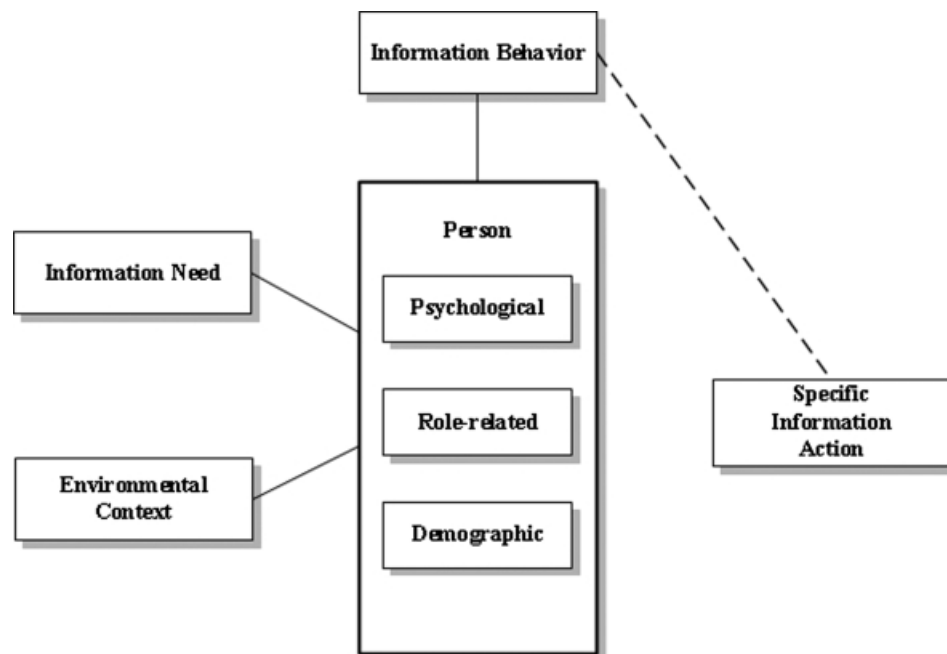


Figure 4: Niu and Hemminger's model of information behaviour (2012, p. 338)

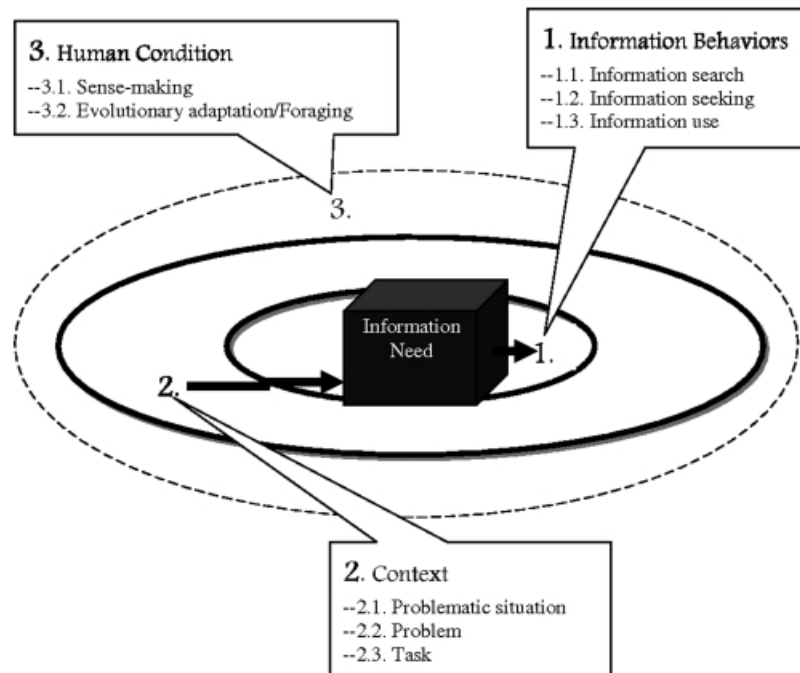
Niu and Hemminger's model shows that information needs and environmental contexts (demographic, role-related and psychological) influence information behaviour, and determines specific information actions of people.

In another information behaviour model (figure 6), Cole (2011) highlights the centrality of information need by presenting it as a form of '*black box*' that explains why individuals seek information (p. 1217). The author emphasises the necessity of understanding the context or situation of information need as individuals concerned do not often know what is required to



satisfy an information need at the point it becomes evident (p. 1216). Webber and Johnston, (2000), believe similarly that ‘*individuals can only shape contexts, thereby conceptualizing their worlds, if they understand active ingredients of context and how they act upon them*’ (p. 384).

Cole’s (2011) model, shown in figure 5 advances 3 categories of information need surrogates as it relates to people’s information behaviour.



**Figure 5: Information needs as a Black Box, Cole (2011, p. 1217)**

Cole’s model posits that:

1. Information need should be analysed through the information behaviours which it precipitates in individuals such as information seeking and use.
2. It is the context in which the users find themselves, such as in a problematic situation, problem and task that produces users’ information needs.
3. Information need is fundamental to the human condition and is applied through sense-making and adaptation (p. 1217).

Similarly, Wilson (1981) cited by Wilson (1997, p. 552) attributed primacy of influence to people’s information need in dictating their information behaviour, as shown in figure 6.

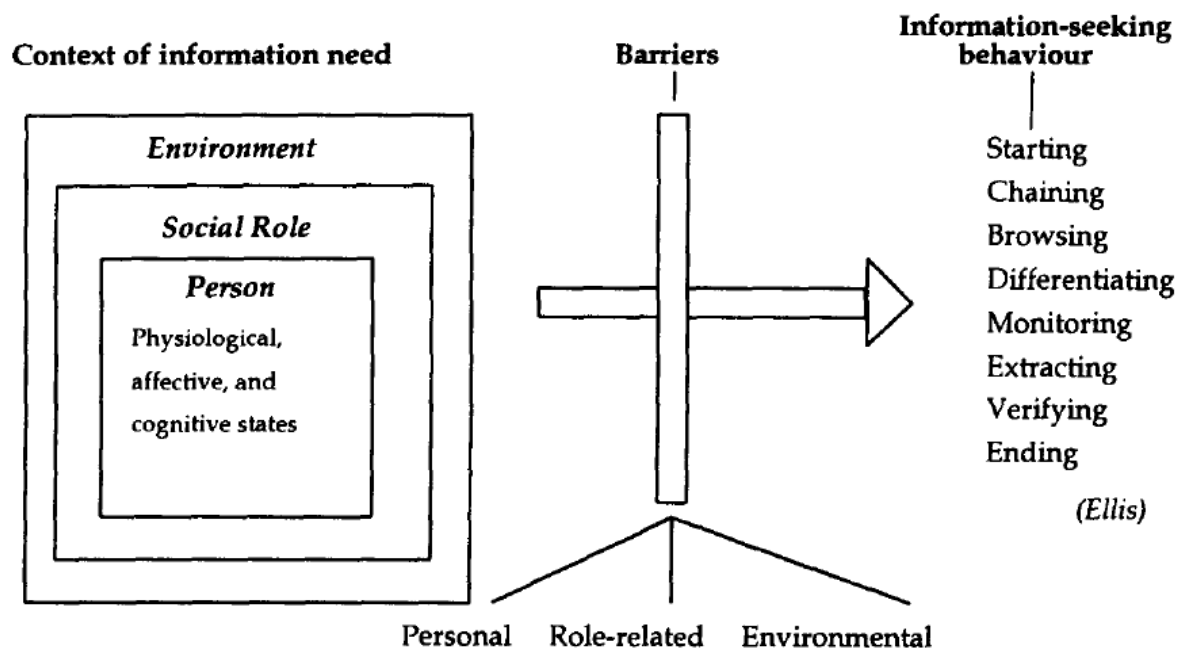


Figure 6: A general model of information behaviour (Wilson, 1981, revised)

Wilson (1997) gave prominence to information need in orchestrating people's information behaviour when stating that the concept is '*at the root of the problem of information-seeking behaviour*' (p. 552). The author listed other components of people's information behaviour as: *information seeking, information exchange, and information use* (p. 552). He further inferred that elements such as: the situation that caused the need to arise; the barriers that may be encountered when engaged in the information task; and, the information behaviour itself, were '*the circumstances that give rise to information-seeking behaviour*' (p. 552). The inclusion of information behaviour in the list of these circumstances is, however, debatable in view of the long-held notion that nothing is capable of causing itself.

Hepworth's (2007) analysis on the different epistemological positions on information behaviour research indicated the perspectives as cognitive/conative, sociological/anthropological and affective. The author inferred that '*little has been done to incorporate or support such differences*' into a holistic perspective (p. 42). In his further view:

"From a positivist perspective a rich array of societal and social factors are seen to lead to the creation of an information environment, the design of which is influenced by the characteristics of the individual and their ISB [information-seeking behaviour]. The IB of the individual may, in turn, be affected by the external information environment as well as their internal psychological "environment". From a social constructivist perspective we can interpret

this as a collection of shared labels and meanings i.e an ontology of what we study which has evolved to help us understand IB” (p. 43).

The three levels of information behaviour abstraction by Hepworth (2007) suggest a blending of the positivist and social-constructivist perspectives. These perspectives operate within the same learning domain, with distinctive characteristics. This was similar to Kulthau’s (2004) “*Information Search Process (ISP) Model [which] united affects behaviour and cognition to explore the interactions between people, systems and information*’ (Kulthau, 2004, cited by O’Brien 2011, p. 77).

Hepworth’s (2007) three levels of information behaviour abstraction model are shown in figure 7.

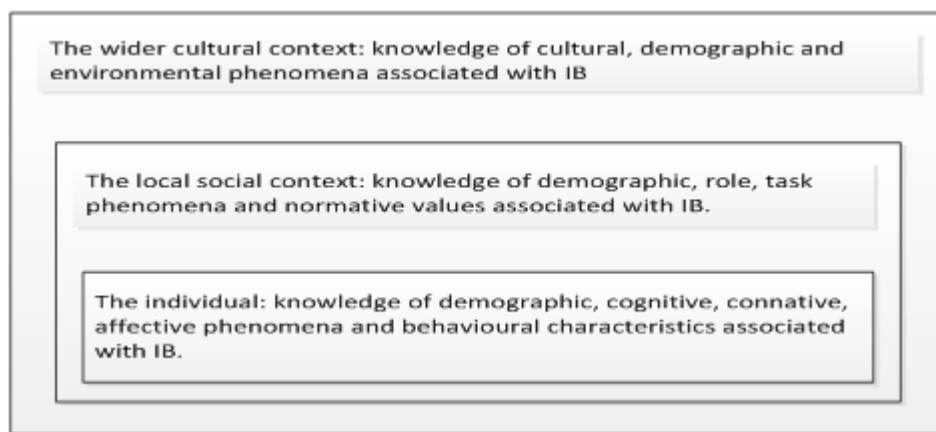


Figure 7: Three levels of information behaviour abstraction, Hepworth (2007, p. 42)

Hepworth hints on the importance of understanding the interplay between the phenomena associated with information behaviour. The model explains the sociocultural and sociotechnical perspectives of information literacy. The model infers that individuals demonstrate the practical application of information behaviour in roles at the individual, local social and wider cultural contexts, in a continually evolving process.

Detlor (2003) portrayed the information behaviour of individuals within a work or social setting using Cho’s (1998) model of information use shown in figure 9.

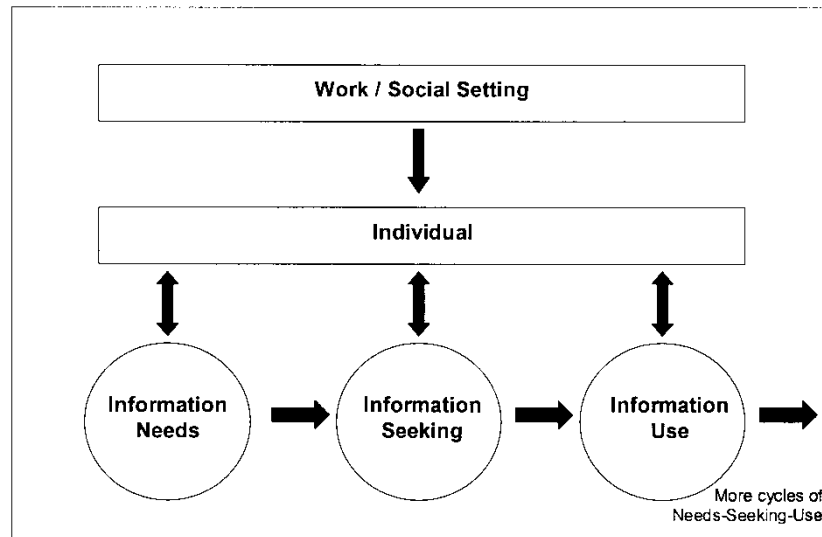


Figure 8: Cho's (1998, p. 6) General model of information use adapted from Detlor (2003, p. 116)

In Detlor's view (p. 116), the first iterative circle of activity, **Information Needs**, portray the point where individuals recognise gaps in their states of knowledge and in their abilities to make sense of an experience. The second stage, **Information Seeking** is where needs are articulated as questions or topics that guide the choice of information sources, while the third stage, **Information Use**, involves the selection and processing of information. The author concludes that this is an iterative process.

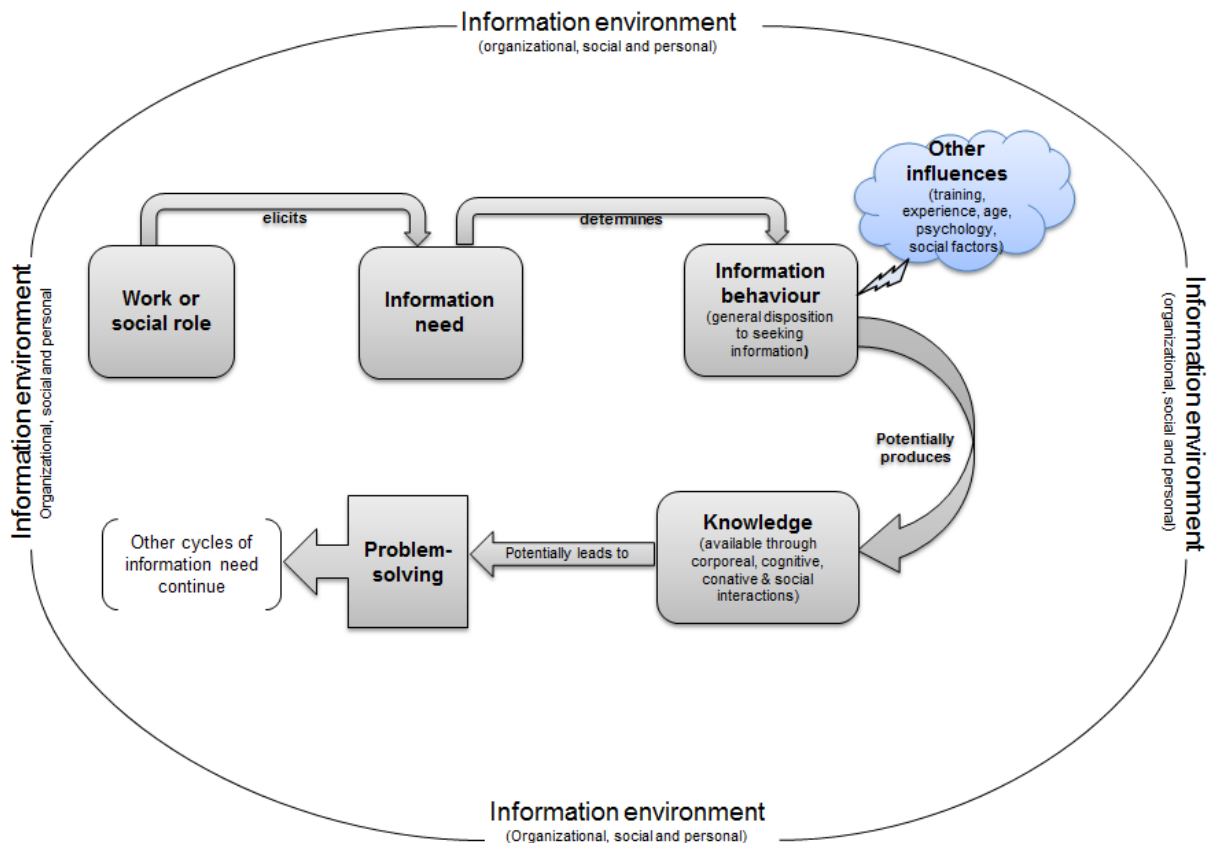
Cho's model demonstrates that information need is felt by individuals within a work and social [role] context, and that this triggers information seeking for information use. The model depicts the process as unending. This perspective aligns with other scholarly views on human information needs that infer the continuous influence of people's information environment in shaping their information needs and individual responses.

It could be perceived from the different models that there are several perspectives on the causative factors and outcomes of people's information behaviour. The model shown in figure 9 is a synopsis of these perspectives on information behaviour aimed at unifying the views of the various authors. The new model will be used to interpret the results of this study in relation to the information behaviour of the paediatric physicians.

### 2.7.2 Model of causative and outcome factors of people's information behaviour

Figure 9 highlights people's information behaviour and information practices within an information environment. The researcher developed this model based on a synthesis of views contained in previous studies on people's information behaviour.

The reviewed studies highlighted the constructs of information environment (Lloyd 2010a, 2010b), information need (Nui and Hemminger, 2012; Cho, 1998; Case, 2007; Clarke et al., 2013; Cole, 2011), role (Li and Belkin, 2010; Lloyd, 2010a; Nui and Hemminger, 2012), information behaviour (Hepworth, 2007; Hepworth and Walton, 2013; Nui and Hemminger, 2012), and the knowledge created within a community as factors that influence people’s information practices, in relation to their information capabilities.



**Figure 9: Causative and outcome factors of people's information behaviour and practices**

Source: Author’s synthesis of some information behaviour models.

The above perspectives on people’s information behaviour portray the concept as a primary consequence of the constant interplay between their information need and work or social role, where work / social role is the starting point (Li and Belkin, 2010; Walton and Cleland, 2013). Li and Belkin (2010) consider the demands of different work tasks as the primary influence on users’ interactive information search behaviour. This assertion implies that people’s work or roles within society is the stimulus for their information-seeking behaviour. Consequently, the extent to which individuals are able to solve their information need is determined by their information behaviour (Case, 2007).

Case (2007) clarifies that individuals do not compulsively '*think, feel, or do something about*' the information at their disposal because '*informed behaviour does not always result from exposure to information*' (pp. 98-99). This factor explains the relevance of the information behaviour '*other contextual influences*' argued by Warner and Bath (2015, p. 93) in their model, represented in a modified manner this model as 'other influences'. These other influences predispose individuals to behaving in different ways towards information search and use, even if influenced by the same or similar information environments.

The undergirding assumption in the reviewed models on people's information behaviour is that to be effective in information practice, particularly in the workplace, people must learn how to engage and adapt to their information environment. This adaptation could be done through developing ability to acquire and utilise relevant information (Pirolli, 2005 p. 343).

This model by the author was used in the discussion chapter as basis for explicating the context of the paediatricians' information practices so as to verify where the findings concur with, contest or contributes to the wider existing knowledge.

## **2.8 Information needs of physicians**

In the foregoing discourse it has been argued that information seeking is driven by the information needs that people have as a general rule of information behaviour. Callen et al. (2008) infers that physicians need access to reliable medical information to be able to deliver best possible care to their patients. Their proposition infers that the main reason physicians need information is for the appropriate treatment of their patients. Similarly, Ely et al. (2005) suggests that physicians' information need may be about specific patients or general information.

Other authors found that there is progressive increase in the role of information use in healthcare and that physicians' information needs are on: diagnosis, drug therapy, epidemiology, and treatment therapy (Davies and Harrison, 2007, p. 79). Clarke et al. (2013) revealed the types of patient-specific information needs of primary care physicians as; information on diagnosis, medications, treatment, epidemiology, prognosis and aetiology, and stated that both resident and attending physicians had the same information needs. Dee and Blazek (1993) noted that physicians obtain information about new medical findings, new prescription drugs, and how information services contribute distinctly to patient care (p. 259).

In a study conducted in Aylesbury Vale UK, Byrant (2004, p. 88) listed the order of ranking by doctors of their perceived information needs as: clinical care; keeping up-to-date; information for patients; pharmacological information; [information to close] gaps in knowledge; curiosity; and, uncertainty. This finding aligns with the findings of Callen et al. (2008) that *'the clinical care of individual patients was the primary reason for (doctors) seeking information'* (p. 250). Byrant stated that the senior doctors who were the GP trainers, ranked information needs for engaging in the training of junior doctors highest, an indication of the importance of information support to their teaching duties.

Lappa (2005, p. 124) reports from a study that for 100% of the clinicians studied, their main information needs arise while treating patients in daily practice. Currently, medical practice has integrated the use of clinical decision support systems (CDSS) to assist doctors in arriving at the best possible decisions in daily clinical practice. Clinical decision support systems have been described as *'a powerful tool for improving healthcare quality and patient safety designed to help humans make better decisions'* (Wright et al., 2009, p. 334). It possesses the potential to effectively and safely support medication prescribing (Horsky et al., 2013).

Physicians' information needs in relation to capacity development within the context of using an information system were identified as: navigational issues, cross-referencing with other objects, laboratory results, pharmaceutical information, alternative or differential diagnosis, definition of terms and general information (Allen et al., 2003, cited by Kannampalli et al., 2013). These views align with the perspective that work or social role is the primary precursor of people's information needs.

Studies have suggested that information use increases the capacity of doctors to take the most appropriate decision during patient care (Percheski and Hargiatti, 2011; Rice, 2006 and Grossman and Zerilli, 2013). One of the crucial information needs of physicians has been linked to the use of evidence. Green et al. (2000) consider the first step in evidence-based decision making as involving the conversion of medical information needs into focused clinical questions to generate new medical knowledge.

To cater to the need of information among physicians in healthcare provision for the UK, Harrison and Sargeant (2004, p. 220) espoused the significance of the role of the clinical librarian in supporting physician roles. The authors infer that this will buttress the importance attached to the UK's National Health Service (NHS) for the use best evidence to support patient care. In a similar report for Ireland, Harrison et al. (2013) suggested that Irish health

libraries promote the centrality of health libraries to evidence-based practice by accelerating the *'marketing of librarians' expertise* in facilitating the use of evidence (p. 100).

These authors' appeal was hinged on the recognition of the specialist information search service which the library could provide to physicians in the patient care process, and which increases their relevance. In a similar view, Brettle (2013) suggests that besides anchoring evidence based practice by mainly supporting physicians' literature reviews and providing training in personal search, health librarians could actively support physicians' information needs in other ways. These other roles that facilitate evidence-based practice are in four domains:

1. A supportive role, using traditional skills and expertise to train clinicians to find evidence for practice, to find evidence on behalf of clinicians, or to provide expert searching and guidance in relation to systematic reviews
2. A supportive role, using their knowledge of critical appraisal to teach critical appraisal or to critically appraise search results to support health professionals in their EBP [Evidence Based Practice].
3. An active role, using research or critical appraisal to conduct systematic reviews
4. An active role, using the EBP skills (critical appraisal or research) outside the library but in the health and social care domain (pp. 1-2).

In order for clinical medical librarians to provide this information service support effectively, Green, et al. (2000) suggest that the *"knowledge about the frequency, character, and pursuit of these information needs [by physicians] would be useful in developing systems and curricula to help physicians practice evidence-based medicine"* (p. 218).

The monitoring of in-patients during ward rounds is a routine in the work of doctors which engenders information need for the writing of the morning reports (Weaver, 2011; Gilbert, 1999; Brady and Kraft, 2012). In a particular hospital, the provision of *'Daily Learning Packages'* by clinical librarians is used to enhance the capacity of the residents to effectively write these reports which are a compulsory feature of the residency programme (Weaver, 2011 p. 402). This type of clinical librarian information service enhances *'Medical Ground Rounds'* by providing new physicians with *'current thinking'* in medicine (Gilbert, 1999 p. 70).



These foregoing perspectives buttress the importance of clinical librarianship service for providing information support in physicians' evidence-base practice. The centrality of this service was similarly highlighted by Marshal (2014):

“Health sciences librarians have played a key role in initiating; nurturing, and spreading EBP...we can observe the continuing evolution of our own unique approach to using, creating, and applying evidence from a variety of sources to improve the quality of health information services” (p. 14).

Plugging the information needs of physicians at the right time with appropriate medical information has become vital for effective patient care. This imperative owes to the gaps that exist between physicians' medical knowledge of good patient care and the actual knowledge that was applied during patient care (Gertrude Lamb cited by Lipscomb, 2000, p. 393). This gap in the applied knowledge detaches physicians' training and knowledge of best practices from the actual practice. There is an increasingly popular perspective that the physician's possession of functional information literacy provides capability to resolve this gap between knowledge and practice.

It has been identified that doctors need the provision of on-site referencing services from clinical librarians as part of plugging this knowledge to practice gap. Gilbert (1999) infers that this information service increases effectiveness of patient care and helps to prevent the incessant malpractice litigations against doctors. Providing quick reference information has been on the increase in clinical emergencies. Clinical medical librarian service has been identified as particularly important in the Emergency Department (ED) of hospitals, where '*quick reference material service*' is needed together with special information designed for the support of the individual patient. It also provides information to the clinician for maintaining contact with other health workers in that period of emergency (Lappa, 2005 p. 125).

Keating et al. (2004) applauded the importance of providing doctors with evidence-based clinical guidelines for use in the Emergency Department of hospitals as contributory to ensuring best practice and achievement of right results (p. 46). Clarke et al. (2013) similarly buttressed this imperative:

“if information needs remain unanswered at the time physicians and nurses are making clinical decisions, then delayed or uninformed decisions might occur with consequences

for medical errors like incorrect diagnosis, error in administering treatment or failure to provide prophylactic treatment which impacts the quality and outcome of decisions” (p. 179).

D’Alessandro et al. (2004, p. 18) suggest that a physician’s decision making at the point of care is affected by information resources at their disposal in the decision making process. These assertions should spur the quest for a thorough understanding of physicians’ information needs and to support those needs with appropriate clinical information service. It has been similarly argued that doctors need information support for conducting clinical research to enable them develop the grounding in methodology for interpreting or effectively performing research (Fisher and Wood, 2007, p. S67). In this vein, health librarians need to identify such research projects and partner with clinicians for offering their information skills to enhance the process (Harrison et al., 2013, p. 101). The crucial role of clinical librarians in supporting the clinical information needs of physicians is demonstrated when these services are provided effectively.

Sustaining the capacity of a physician to take appropriate clinical decisions has been widely linked with the ability to constructively apply medical information during practice.

### **2.8.1 Information sources for satisfying physicians’ information needs**

There are numerous challenges that physicians face in keeping their practice current. Prominent among these challenges is the rapid production of knowledge available in diverse media formats. This rapid information output particularly from electronic sources inundates physicians with information, through articles, reports, and monographs with contents relevant to general and specialized practice (Dee and Blazek, 1993, p. 259).

Online medical information sources offer *‘search facilities...and the ability to perform citation analysis’* which makes the location of information simpler for physicians who possess some degree of information competence (Falagas et al., 2008, p. 338). Conversely, physicians who are deficient on information capability would most probably find access to needed information daunting within the maze of information that is constantly being produced.

Falagas et al. (2008) conducted a comparison of the strengths and weaknesses of four computerised online databases: PubMed, Scopus, Web of Science, and Google Scholar for obtaining medical information and discovered that:

“All databases were practical in use and offered numerous search facilities. PubMed and Google Scholar are accessed for free. The keyword search with PubMed offers optimal update frequency and includes online early articles; other databases can rate articles by number of citations, as an index of importance. For citation analysis, Scopus offers about 20% more coverage than Web of Science, whereas Google Scholar offers results of inconsistent accuracy. PubMed remains an optimal tool in biomedical electronic research. Scopus covers a wider journal range of help both in keyword searching and citation analysis, but it is currently limited to recent articles (published after 1995) compared with Web of Science” (p. 338).

The importance of electronic information media devices or i-media for enabling access to useful medical information is increasingly permeating medical practice. Masters (2008a, 2008b); Rice (2006); Hughes et al. (2009) considered the Internet as increasingly popular among physicians as a source of medical information and as a means of improving healthcare delivery. Grossmann and Zerilli (2013) studied health and medication resources on the World Wide Web and reported that several sources of information were available to physicians on a subscription basis or free.

Some customised uses have been made of the potentials of information technology in providing medical information for clinicians. Lucas (2008) reported the success of an exploration of the potential uses of handheld Personal Data Assistants (PDAs) in Ghana, Kenya and Uganda by health professionals. This exploration led to the design and implementation of the Uganda Health Information Network (UHN). The primary aim of this network was to *‘allow the electronic compilation and transmission of Ministry of Health routine data forms in addition to information on disease outbreaks’* (p. 2124). Similarly, Pandey et al. (2013) identified Smartphone Applications as a tool for delivery of health-care information to and by healthcare professionals in another study.

There is presently an increasing importance of the Electronic Health Records System to the delivery of health information in healthcare institutions. Consequently, hospitals worldwide are moving towards adopting this system in their patient care routines. Egea and Gonzalez (2011); Chau and Hu (2002); Flanagan, et al. (2003) have all noted that Electronic Health Care Records (EHCR) are useful sources of information for physicians capable of enhancing physicians information practices during patient care and the outcomes of the process.

## 2.8.2 Information needs of paediatric physicians

Several studies have been conducted on the information needs of physicians. Despite these studies, Woolf and Benson (1989) inferred that more knowledge was needed because *'medical information science has not acquired a formal understanding of the information needs of physicians'* (p. 372). This view may no longer be popular today given the vast array of research existing with several reports on the information needs of physicians such as Davies and Harrison (2007) and D'Alessandro et al. (2004). The authors further posit that:

“medical decision making is being revolutionized by new techniques in information management, improved methods for accessing the medical literature, and the growing application of expert systems to clinical practice” (p. 378).

The information needs of physicians vary according to their different specialties (D'Alessandro et al., 2004). However, the specific information needs of paediatric physicians as a distinct group have not been deeply studied and outlined in the literature (D'Alessandro et al., 2004, p. 18). D'Alessandro et al.'s (2004) study reveal that the most common generic questions paediatricians ask in expression of their major areas of information need is; *“What is the dosage of drug X? What is the treatment for condition X? What is condition X?”* (p. 21). Yoon et al. (2010) assert that paediatricians need information on drug labelling in order *'to establish safety and efficacy for a given medication for use in children'* (p. 743). The main areas that safety was often sought were on a drug's indication and use, dosage and administration, and adverse effects. This subsequently provides direction to the physicians' in their prescription of the drug for their patients. Paediatricians also need to know about any special health services initiated in support of child health care. These relate to early preventive treatment services where paediatricians are well positioned to play key roles in identifying children in need of the services (Helm and Shishmanian, 1997, p. 225).

The imperative of paediatric physicians developing information sourcing and utilization capacity for clinical practice was highlighted in a study which revealed that the paediatricians *'often are asked or ask themselves questions for which they do not have a ready answer'* (Norlin, et al., 2007, p. 396). This finding underscores the value of information in enhancing the paediatrician's ability to master practice expectations and stimulate the trust of patients during care. The American Academy of Pediatrics (2012, p. 400) recommends the proper education of all trainees and residents to develop information capacity for proper patient-and family-centred care. They infer that this has become increasingly central to the practice of paediatric health care globally.

## 2.9 Information-seeking behaviour (ISB) of physicians

Studies in peoples' information behaviour as earlier discussed revealed that in most information environments there is a tendency for individuals to behave differently towards the satisfaction of their information needs due to a host of intermediating factors. Information behaviour of physicians has similarly been described as the way they search for and utilise information to satisfy their information need (Clarke et al., 2013, p. 179). It has been suggested that this could be influenced by clinicians' use of intuition to determine what information search to embark on or otherwise (Allen, 2011, p. 2168).

There are not as many studies conducted on the information-seeking behaviour of paediatricians as has been done on their information needs. However, the study by D'Alessandro, et al. (2004, p. 64) suggest that General Paediatricians in the US sought answers to clinical questions and obtained high answer rates to their clinical information needs thus displaying positive information seeking behaviour. Their findings also showed higher rates of computer and digital library use for clinical interventions among the physicians. This latter behaviour followed the introduction of an information literacy instructional intervention.

Perkins (2015) suggests that information literacy enables healthcare professionals to make decisions, promote change, advance their skills and influence leadership. Medical practitioners need the skills to find relevant information and evaluate its authenticity, validity and reliability (Carr et al., 2011, p. 136) and to apply it for various purposes (Davies and Harrison, 2007, p. 82). It has been argued that, '*the information-seeking behaviour of physicians depends on the information needs they choose to pursue*' (Clarke et al., 2013, p. 179). The undergirding factor behind this was enunciated by Ely et al. (2005, p. 217) who identified lack of time [for searching] and poorly organized personal libraries as the major inhibitor for physicians in finding answers to most of the questions they have at the point of care. This reason could inform why physicians decide not to pursue answers for all their felt clinical information needs.

Studies conducted in the UK and Tanzania respectively by Gabbay and May (2004) and Chandler et al. (2008) revealed that doctors rarely relied on explicit knowledge from research and other sources during patient care. The clinicians preferred to rely on the tacit knowledge shared amongst them through interpersonal interactions. These findings were consistent with

Gorman's (1995, p. 734) report showing physicians' preference for human sources of information in meeting their information needs.

Chandler et.al attributed this inclination to four reasons which they called '*social spheres of influence*' as:

“the influence of initial training within a context; peer influence or pressure to perform to the expectation of colleagues; pressure to yield to patient preferences; and, quality of diagnostic support” (p. 1).

In a contrast to the foregoing, studies conducted in the United States by Bennett et al. (2004); Strasser (1978) cited by Osiobe (1985); and Green et al. (2000) indicate that doctors relied on explicit sources of information during practice. In these studies journals and textbooks were ranked as the most important sources of information. Similarly, Thompson's (1997) study revealed the combined use of the two types of sources – print and oral by physicians. It showed primary care physicians' preference for print resources and the medical literature, together with consultation of colleagues and continuing medical education (CME) activities as information sources they used (p. 189).

In similar vein to Thompson, Bennett et.al revealed that preference for journals and textbooks was followed by reliance on the National Continuing Medical Education (CME) meetings, videotape/audiotape/CD-ROM, websites and local CME meetings as physicians' information sources. Their study further showed that most of the doctors rated the Internet as very or extremely useful for clinical information (p. 34).

A study similar to the foregoing was conducted in the UK by Hughes et al. (2009) and revealed that 89% of physicians used at least one web 2.0 tool in their medical practice. These findings underline the increasing popularity of electronic sources in the literature. Another study by Clarke et al. (2013, p. 185) buttressed this by revealing that the sources of information that physicians consulted was the internet, textbooks, colleagues, journals, professional websites, drug compendium and medical libraries.

In Gorman's (1995) view, studies of physicians' information needs have reported widely disparate results which pose difficulty in making comparisons among them. They infer that this difficulty in comparison owes to differences of methodology: '*the definition of terms, subjects, setting, and method of data collection*' (p. 736).

The divergent findings in these studies appear to indicate that physicians' depend on a variety of knowledge sources for information gathering. This factor suggests that the information-seeking behaviour of physicians requires the conduct of specific studies in different contexts of practice and geographic location to understand the unique peculiarities in people's practices.

The divergences of findings in the literature on physicians' information seeking behaviour suggest that a lack of agreement of the concept is rife. Therefore, the debate about what clinicians potentially do in information seeking will ultimately linger. This implies that contextual studies remain necessary and relevant for understanding the information needs and information seeking behaviour of physicians in specific work environments and for specific contexts of patient care.

### **2.9.1 Use of technology for information seeking among physicians**

Technology is increasingly becoming central to information production and use in all fields. As discussed earlier in this literature review, the healthcare environment is increasingly witnessing the blending of information and communication technology into its routines for enhancing the effectiveness of the delivery of healthcare to patients. Lucas (2008) posit that *'there is a growing consensus that the impact of ICT on health systems will be substantial or even revolutionary'* leading to improvements in the quality of healthcare delivery (p. 2129). These improvements are closely associated with the ability of health care professionals to appropriately utilise ICT for the application of useful medical information during patient care.

The use of the Internet particularly for acquiring health information has elicited great deal of attention as is increasingly being used by doctors to obtain health and medication information in a way that vitiates spatial and geographical barriers (Grossman and Zerilli, 2013; Masters, 2008; Eysenbach and Diepgen, 1998; Rice, 2006; Cotton and Gupta, 2004; Percheski and Hargiatti, 2011). Studies have reported that doctors use the Internet as a medium for other purposes such as collaboration and knowledge sharing (Masters, 2008b; Write et al., 2009), and clinical decision support (Wright and Sittig, 2008). Masters (2008b, p. 9) specifically revealed a high rate of usefulness of the internet to physicians in studies conducted in South Africa. For an aggregate of 10 studies, the result showed a mean score of 51% in the option of useful or extremely useful.

Other reasons why doctors use to the Internet for clinical information were listed by Bennett et al. (2004), in a report of their study as:

“accessing the latest research on specific topics (46.1%); accessing new information in a disease area (44.4%); information related to a specific patient problem (43.7%); drug dose information (40.4%); new therapy or product information (38.1%)” (pp. 33-34).

Bennett et.al further revealed that of those seeking information on specific patient problems: 74.8% sought information on diagnosis or management, 59% sought patient education materials, and 49% sought guidance summaries (pp. 33-34).

Considering the above, the possession of internet information literacy has become essential for doctors particularly as the ‘*ability to formulate a clinical question, search for best evidence, critically appraise and apply evidence remains an essential skill for clinicians*’ particularly in the electronic information search environment (Cullen et al., 2011, p. 120). This ability is needed to improve physicians conversance with different knowledge sources in order to narrow the knowledge gap that exist, for example, in situations where doctors in the UK, regarded British Medical Journal and Cochrane Medical database as Internet search engines (Davies and Harrison, 2007, p. 91), displaying a marked deficiency in Internet Information Literacy. The overarching perspective in these studies is that the Internet has developed into a very useful source of medical information in modern medical care.

Despite this high rate of usefulness of the internet as an information source for physicians, its use by doctors is constantly challenged by some factors. These factors have been identified as access to technology (Arunachalam, 1998), credibility of the information content and that of the websites (Rains and Karmikel, 2009, p. 544) and the ‘*overwhelming amount of health-related information on the web, potentially leading to incomplete search of the entire literature on a topic*’ (Grossman and Zerilli, 2013, p. 85).

In view of these factors, querying the credibility of information from the Internet is considered necessary to ensure that clinicians applied the correct information to patient care. Weisboard (1997) cited by Eysenbach and Diepgen (1998) states that ‘*the quality of medical information is particularly important as misinformation could be a matter of life or death*’ (p. 1496). Eysenbach and Diepgen (1998) emphasised the need for veracity and accuracy of information obtained from health information sources. This probability that clinicians could



obtain misleading information from questionable sources is a strong consideration for possessing competencies in information use for capability to authenticate information sources and content.

One of the fast evolving technological tools in clinical care is the use of clinical decision support systems (CDSS) to enhance clinical decision-making. The reasons for using CDSS have been adduced as; preventing errors, improving quality, reduction of cost and saving time (Wright and Sittig, 2008, p. 982). Most CDSS are dependent on or products of information and communications technology, implying that doctors must be proficient in the use of ICTs to effectively use them.

The use of Personal Digital Assistants (PDA) has also been on the increase in clinical care. Dee, et al. (2005, p. 481) in a US-based study revealed an 87% compliance among physicians in the use of personal digital assistants (PDA) in information retrieval and clinical decision making at the point of clinical care. Leu et al. (2012) in a specific study of paediatricians' use of information technology in the US revealed that technology adoption encountered some barriers. These barriers bothered on financial and productivity issues and clinicians concerns that '*systems do not provide the specific functionality necessary to care for paediatric patients*'. This finding contrasted with the predominant views on the functional importance of health technology in enhancing clinical decisions (p. e1441).

## **2.10 Information practices among healthcare professionals in Nigeria**

A few studies have been conducted on the information behaviour of physicians in Nigeria with respect to the information sources people use. Such previous studies on the information use of healthcare professionals in Nigeria Baro (2013); Komolafe and Onatola (2008); Nweke (1995); Oduwole (999) and Ajuwon (2006) indicate that medical professionals use various forms of information resources, mostly from explicit sources, for anchoring their decisions in patient care.

Ajuwon's (2006) study of physicians' use of the internet for health information in a teaching hospital in South West Nigeria reveals that 90% of doctors used internet to obtain information for patient care (p. 7). However, their use of evidence-based medicine resources was minimal (p. 1). Another study of three teaching hospitals in south west Nigeria by Idowu, et al. (2003)) revealed that the hospitals did not provide internet connectivity forcing doctors to use private

means to access the internet (p. 71). The clinicians also relied heavily on mobile phones for communication between wards, consultation and patient care administration (p. 73), mirroring a combination of explicit and oral sources of information. Both studies agree that doctors used the internet as a source of information, with Ajuwon (2006) revealing that e-mail was the most commonly used internet service among the doctors (p. 7).

In a different study of two teaching hospitals in South West Nigeria, Oduwole (1999) indicated that the doctors sought information for the purposes of managing patients, evaluating new drugs and support for the diagnosis of ailments. The doctors utilised sources such as; scientific and technical journals, Index Medicus, Excerpta Medical, CD-ROM (MEDLINE) databases, and foreign magazines (p. 109). The doctors in the study rated the information from these sources as very useful for clinical decisions during patient care

Meremikwu et al. (2011, p. 249) inferred in another study that the number of Nigerian physicians contributing to the Cochrane evidence-base medical database has increased in the recent past. This development is indicative of a positive disposition by Nigerian physicians the use of electronic information resources.

Apart from physicians, other health care professionals' information behaviour has been similarly reported in the literature. Komolafe and Onatola (2008) and Baro (2013) studied the information-seeking behaviour and information use among nurses in Nigeria and reported the use of explicit sources such as textbooks. Ajuwon (2003) studied the internet information use by trainee nurses and first year clinical students. The study revealed that 63% of medical students regularly obtained health-related information from the Internet. The study further revealed that although cyber café was the most commonly used source for internet access, majority of the students had never searched a medical database (p. 3).

Baro's study of two hospitals in Bayelsa State in South-South Nigeria revealed that better patient care was the strongest reason nurses sought for information. This reason was followed by information on medication, better job performance and keeping up-to-date (p. 188). The sources that the nurses consulted for information, agrees with the findings of Komolafe and Onatola (2008) with the exception of seminars and workshops were; colleagues, Nursing Journals, Internet, Medical databases, Librarians and books were the sources nurses relied on for medical information (p. 189). Nweke's (1995) study of Health and Veterinary Medical Scientists in Nigeria displayed a similarity in information behaviour with the nurses.

A study of information behaviour of medical students in South-South Nigeria by Baro et al. (2011) revealed that more explicit sources of information: print and electronic were utilised for meeting their information needs. The specific information sources used by the students were ranked in order of importance as; medical journals, textbooks, Internet, Colleagues and the National University Commission (NUC) virtual library (p. 114).

These studies found for the literature review on Nigeria had a regional focus in coverage. The majority of the studies were conducted with scope covering the South-west part of Nigeria. Only Baro (2013) and Baro et al. (2011) provided perspectives from another part of the country, precisely the South-south region. The reviewed studies revealed that healthcare professionals in the two regions valued the importance of information use for patient care, and demonstrated this value by their use of various information sources that were mostly explicit. Also the common thread uniting majority of the reports were the inadequacy of supportive information infrastructure and services to ensure effectiveness in the information practices of the healthcare professionals.

## **2.11 Summary of the Reviewed Literature**

A visualised summary of the salient points raised in the literature review is presented in this section, containing concepts identified as relevant to the study.

## Physicians' information needs

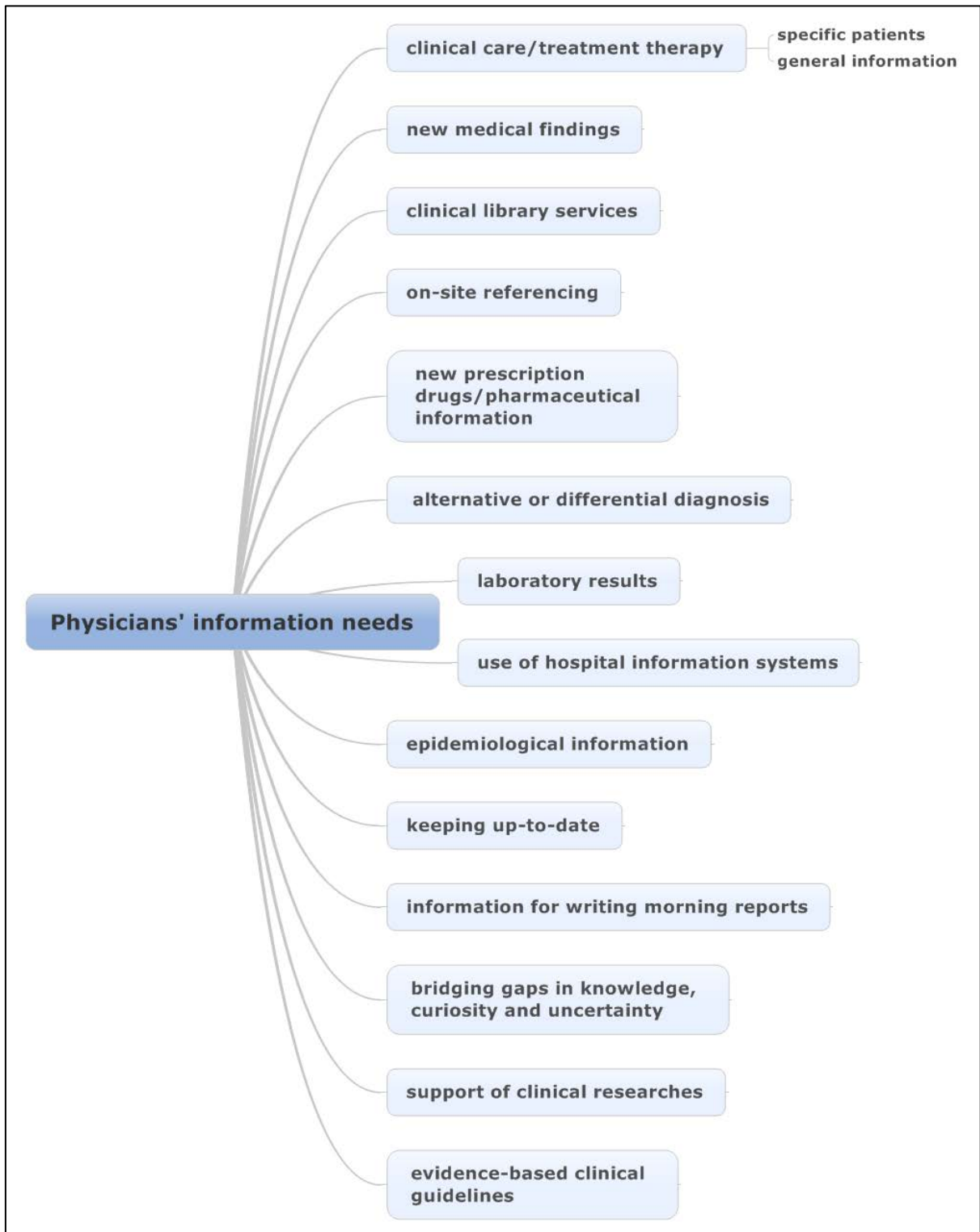


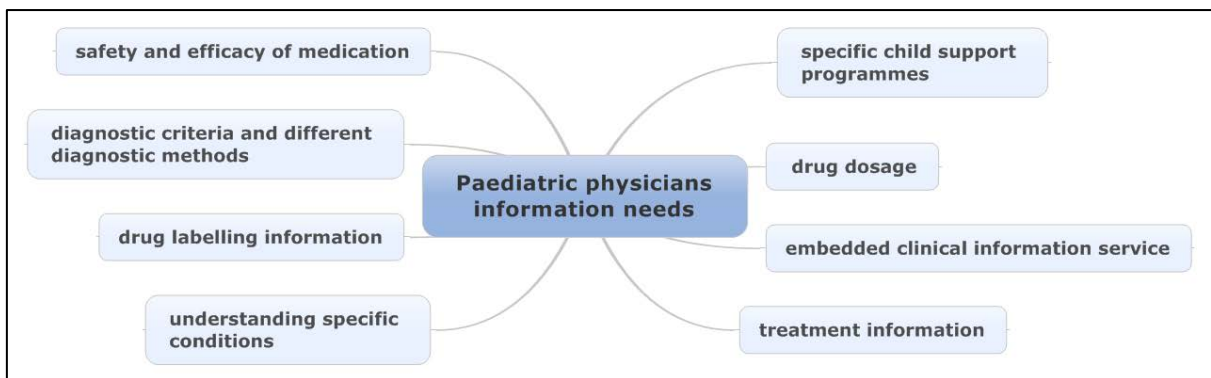
Figure 10: Summary of physicians' information needs as identified in the reviewed literature

Figure 10 shows that previous studies have identified fourteen general information needs of physicians practicing in all sub-specialties of medicine. The diagram which is not hierarchical represents the needs that every physician encounters during practice for patient care. It was identified that physicians generally need information for/on: i) clinical care and treatment

therapy, which in turn could be for a specific patient or on a general note, ii) new medical findings, iii) clinical library services, iv) on-site referencing, v) new prescription drugs and other pharmaceutical information, vi) alternative or differential diagnosis, vii) laboratory results, viii) use of hospital information systems, ix) epidemiological information, x) keeping up-to-date, xi) writing morning reports, xii) bridging gaps in knowledge, satisfying curiosity and resolving uncertainties, xiii) support for conducting clinical researches, and xiv) evidence-based clinical guidelines.

### ***Paediatric physicians' information needs***

The literature review further identified the specific information needs of physicians practicing in the sub-specialty of paediatrics as shown in figure 11.



**Figure 11: Information needs of paediatric physicians as identified in the reviewed literature**

As shown in figure 11, paediatric physicians need information for/on: i) the safety and efficacy of medication (drugs), ii) diagnostic criteria and different diagnostic methods, iii) drug label/leaflets information, iv) understanding specific disease/treatment conditions, v) specific child support programmes, vi) drug dosage, vii) embedded clinical information service, and viii) treatment information.

### ***Physicians' information seeking behaviour***

The reviewed literature identified the information-seeking behaviour of physicians in relation to efforts geared at satisfying individual information needs. This is shown in figure 12.

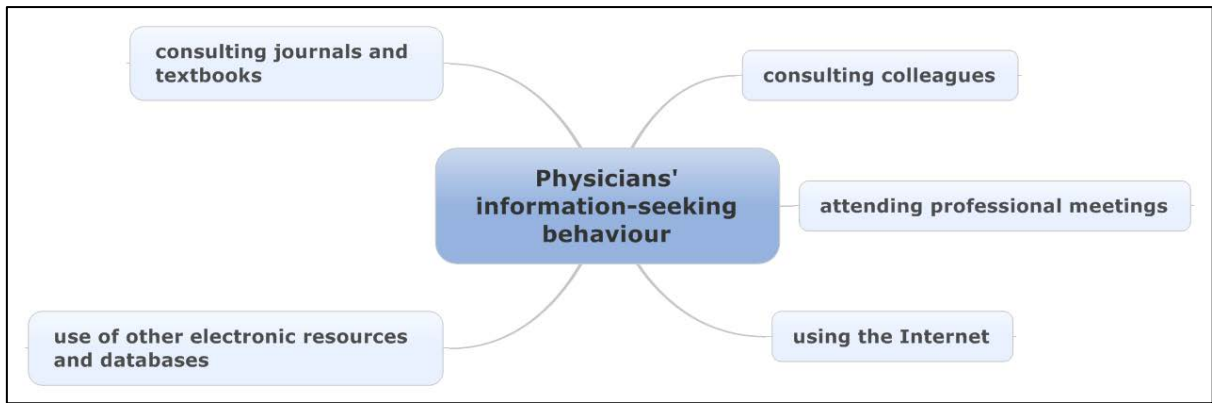


Figure 12: Physicians' information seeking behaviour as identified in the reviewed literature

Figure 12 shows that the literature review identified five major means physicians' adopt for satisfying their information needs. The five means are: i) use of journals and textbooks, ii) use of electronic resources and databases, iii) consulting colleagues, iv) attending professional meetings, and v) using the internet.

***Information literacy practice***

The identified capabilities which are associated with people's practice of information literacy from the literature are presented in figure 13.

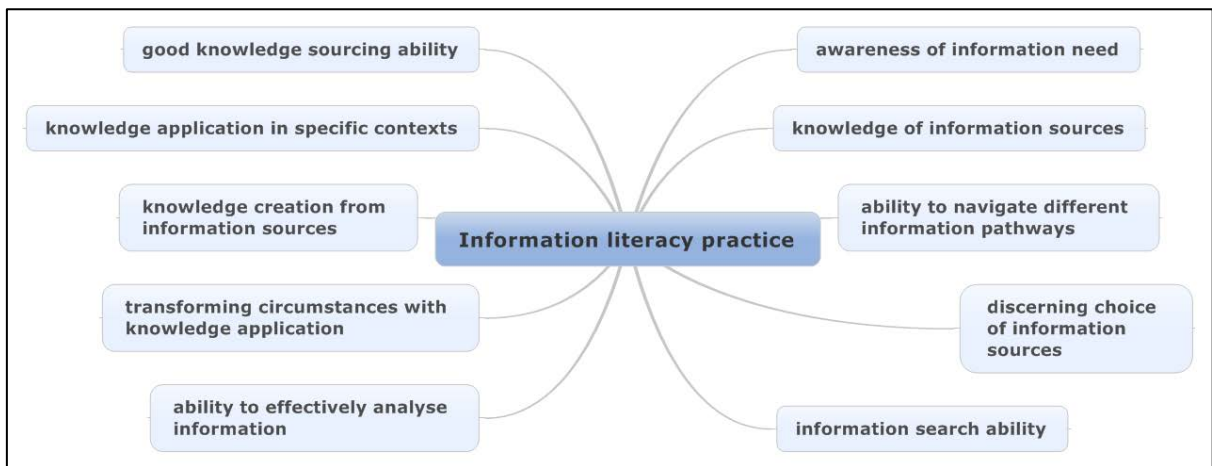


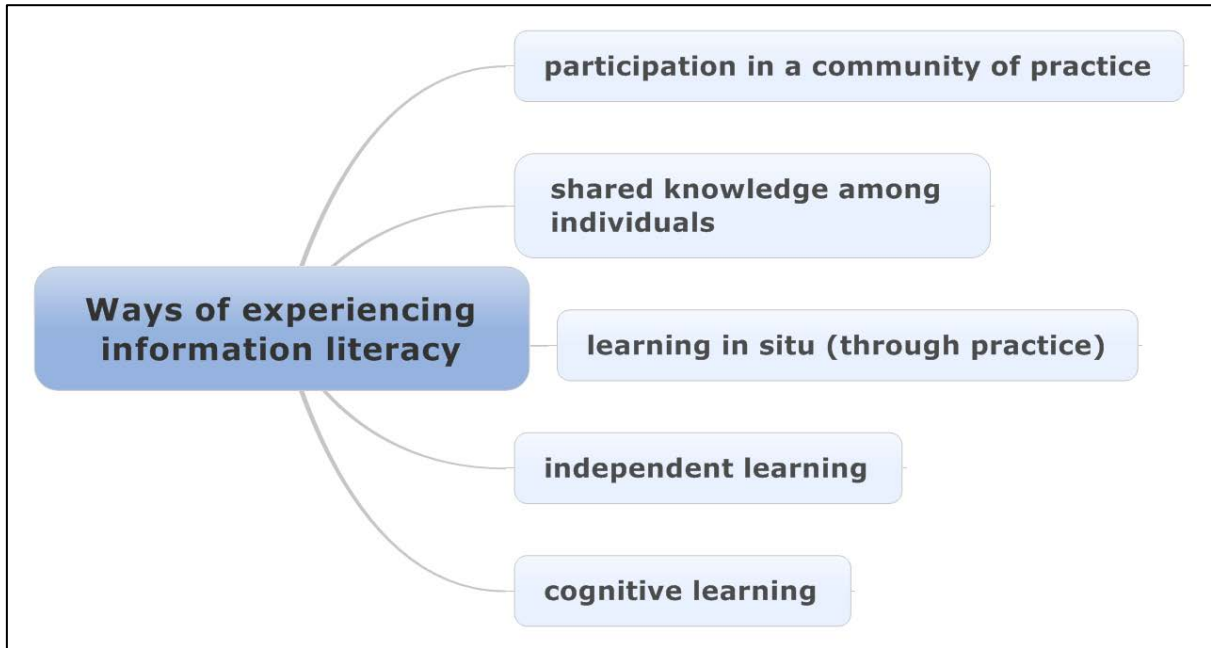
Figure 13: Capabilities associated with information literacy practice as identified in the reviewed literature

This is a non-hierarchical diagram in figure 13 which lists ten capabilities of information literacy practice as: i) good knowledge sourcing ability, ii) knowledge application in specific contexts, iii) knowledge creation from information sources, iv) transforming circumstances with knowledge application, v) ability to effectively analyse information, vi) awareness of information need, vii) knowledge of information sources, viii) ability to navigate different information pathways, ix) discerning choice of information sources, and x) information search ability. These capabilities are exhibited by information literate individuals with none being

more or less important. All the capabilities contribute to enabling the information literate person to be able to practically use information for solving specific individual, everyday life and workplace problems.

### ***Ways of experiencing information literacy***

The specific ways people become information literate to be able to demonstrate the capabilities outlined above is shown in figure 14.

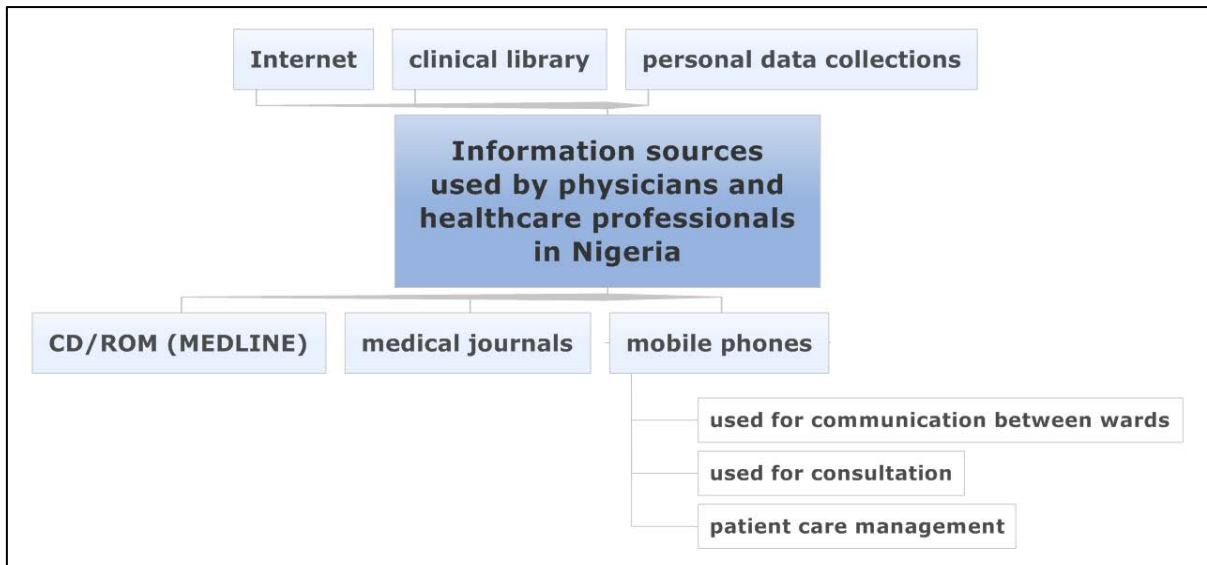


**Figure 14: Ways of experiencing information literacy as identified in the reviewed literature**

Figure 14 is a representation of the means through which people become information literate as identified in the literature review. This indicates the five different ways of experiencing information literacy as: i) participation in a community of practice; ii) shared knowledge among individuals or colleagues; iii) learning in situ or learning during practice; iv) independent learning; and, v) cognitive learning experiences such as taught information literacy programmes.

### ***Information sources used by healthcare professionals in Nigeria***

The literature review identified the information sources presently used by healthcare professionals in Nigeria's health care system as shown in figure 15.



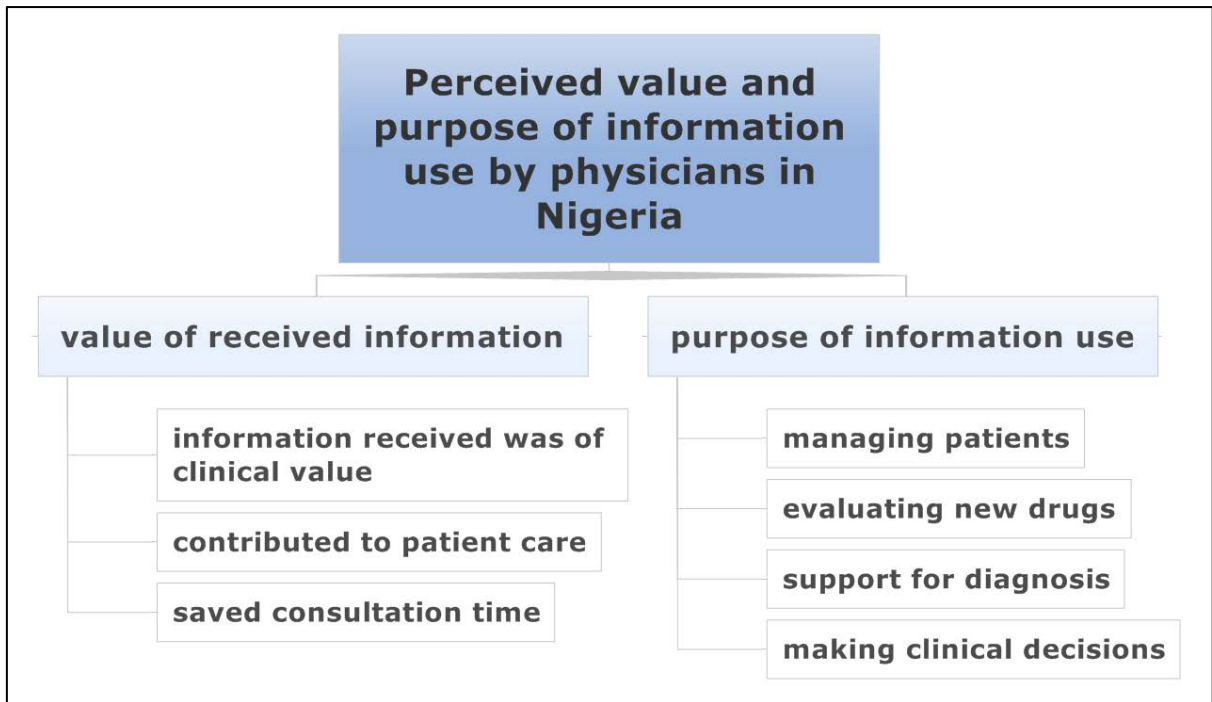
**Figure 15: Sources of information used by medics in Nigeria**

Figure 15 shows the information sources used by healthcare professionals in Nigeria to satisfy their information needs as identified in the reviewed literature. Six sources were identified: i) use of the internet, ii) using the hospital/ clinical library, iii) personal information materials, iv) CD/ROM MEDLINE, v) medical journals, and vi) mobile phones which were useful for/during; communication between wards, consulting patients and patient management.

***Perceived value and purpose of information use by physicians in Nigeria***

The purpose of use and perception of usefulness of information sources by health care personnel in Nigeria as found in the reviewed literature is presented in figure 16.





**Figure 16: Purpose of use and perceived value of information sources by physicians in Nigeria**

Figure 16 shows that physicians’ in Nigeria perceived that the information they received from various information sources had clinical value for decision making, contributed to their care of patients and saved consultation time through increasing their personal knowledge. The physicians’ attributed the purpose of information use to: i) managing patients, ii) evaluating new drugs, iii) support for diagnosis and iv) making clinical or patient care decisions.

## **2.12 Conclusion and the gap identified in what is presently known**

The literature reviewed for this study shows that information literacy is a developed capacity which enables individuals to be discrete and discerning in their use of information. This transpires through an ability of the individual to identify, evaluate, understand and use information within a context and for specific purposes. Information literacy is generally experienced in a learning process comprising aspects of both structured and unstructured learning. This empowers the individual to develop capacity for active engagement with information to achieve personal, social and occupational effectiveness.

Two major perspectives to the development of information literacy were identified – the information literacy skills instruction perspective and the social interaction or social constructivist perspective. The skills instructional perspective focuses on using mostly librarian-led information literacy courses and activities for imparting information practice skills to learners. This approach to making people become information literate is majorly

obtainable in educational institutions where different information literacy intervention programmes for teaching information literacy to students are developed in line with contextual needs.

The literature also shows that from the social constructivist perspective, information literacy experience occurs within the social spheres where people interact. These interactions do not necessarily have to be formal or mediated. For example, information literacy occurs within communities such as in the workplace, as a phenomenon within that environment through which the individual's information consciousness and ability to satisfy his or her information needs are developed. This enables the individual to learn to use the opportunities provided by social interactions to gain ability to acquire and apply the information and knowledge obtainable from those interactions towards enhancing personal effectiveness in defined tasks. Acquiring information literacy in this context occurs in no particular order but is influenced by the individual's roles, tasks, attitudes and existing social norms.

Furthermore, the social constructivist perspective perceives information literacy as increasingly shifting from a bibliographic-skills denoted competency to a meta-competency Lloyd (2010, b). This new competency combines the influences of the cognitive, behavioural, and socio- cultural factors in shaping a person's information competencies and practices. This perspective places emphasis on people becoming empowered from interactions within their immediate information environment to be able to attain personal and occupational effectiveness for engaging in good information practices.

This discourse suggests the importance of conducting situated studies for understanding the specific ways people experience and practice information literacy in specific contexts. For example, studying how physicians in the hospital work-place experience and practice information will be very relevant to placing those information practices in the context of its causative factors and implications for patient care.

The reviewed literature also shows that previous studies on the information behaviour of doctors in Nigeria had more prevalent studies from the South-west region. No precise reason could be adduced for the absence of studies covering other regions, although extensive effort was made to locate every available literature. The literature located for the review indicates there are inadequacies in the availability of information sources for physicians and other healthcare professionals. It also revealed the types of information sources used; the purpose

of information use, and the clinicians' perceptions about the value of the medical information received in patient care.

Although some of the studies reviewed identified barriers to the information practices of physicians in Nigeria on a generic note, no study was found to have been conducted specifically on paediatric physicians specifically. No previous study was found that exposes the nature of the paediatricians' information experiences with focus on how they develop capabilities for information practice. By implication of this dearth of studies, no knowledge exists presently about the physicians' information experiences, their information practices, and implications for patient care. The literature has shown that how people experience and practice information literacy must be studied within specific contexts because of the peculiarities of every context.

In view of this gap in knowledge, this study provides understanding of the information literacy experiences and practices of paediatric physicians in Nigeria in the context of patient care. It provides understanding of the potential implications of the paediatric physicians' information experiences on their information practices and patient care.

# Chapter Three

## Methodology

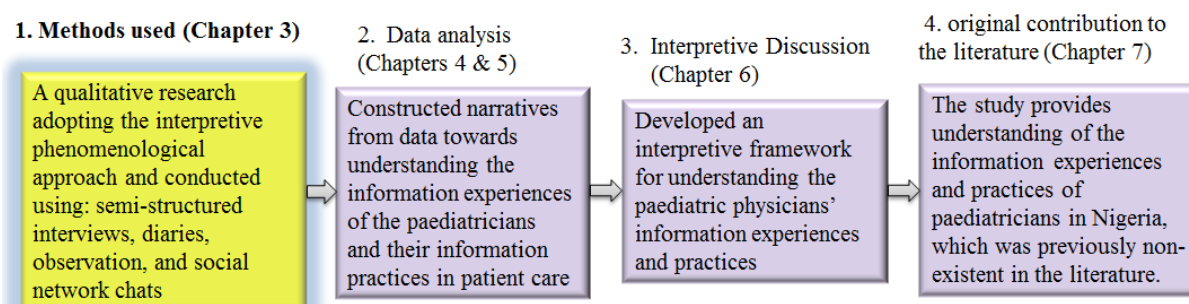


Figure 17: Methods used in conducting the study

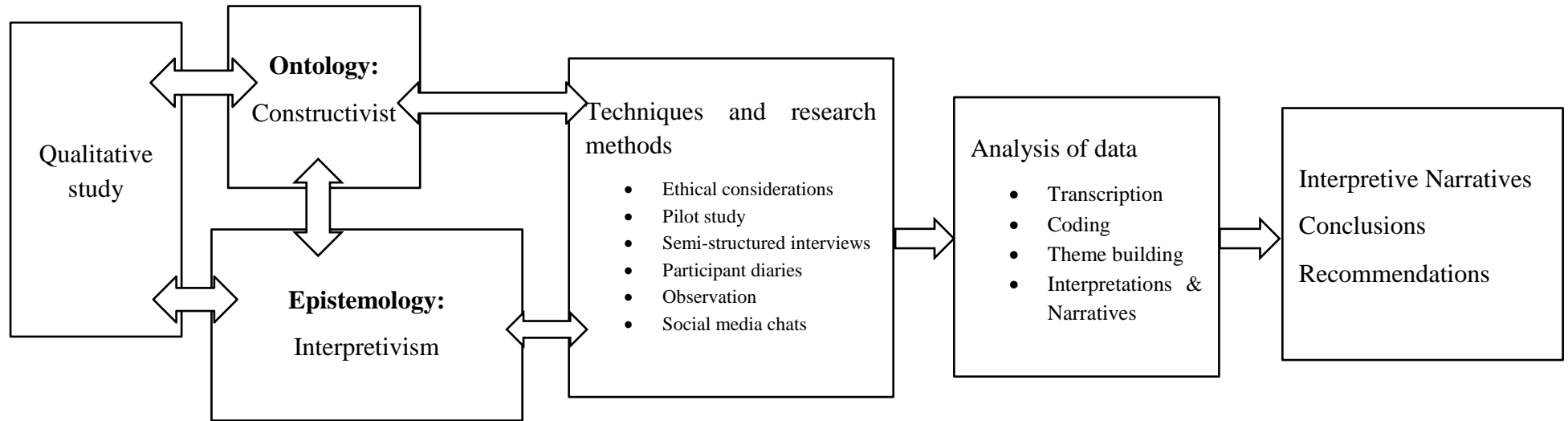
### 3.1 Introduction

The literature review in chapter two identified and discussed the existing gap in knowledge which makes this study relevant. This chapter discusses the methods and procedure through which the study makes a contribution to the literature base toward closing the identified knowledge gap.

This chapter describes the general process through which the research was conducted and it outlines in detail the specific actions undertaken in the process of applying the techniques shown in box 1 of figure 17. The methods used to analyse, interpret the data and present the results are equally discussed in this chapter.

The data gathering techniques used for the study which aimed at eliciting the objects' general information behaviour following from their experiences at the wider cultural, local social and individual contexts (Hepworth, 2007, p. 42) were discussed. Other aims integrated in the choice of the techniques were to understand: the relationship of the work/social setting with; individual information needs, information seeking, and information use (Cho 1998, p. 6, cited in Detlor, 2003, p. 116). Other motive for using the techniques in conducting the research was to establish how the objects' information practices relate to their organizational, social and personal information environment.

The overview of the methodology; philosophy, and techniques used for conducting the research is presented in figure 18.



**Figure 18: Methodological design of the research**

### **3.2 Choice of research setting**

The selection of the setting for the conduct of the study was purposively done by the researcher. The Federal Medical Centre, (former Queen Elizabeth Specialist Hospital) Umuahia, a first generation tertiary hospital in Nigeria, was chosen for the conduct of the study based on the following considerations:

- The hospital was established in 1948 and is now a large organization and in 2013 had 327 beds; employing over 300 physicians, and therefore, was more likely to have paediatricians across all the positions the researcher was interested in studying.
- The perception that the experiences and practices of physicians working at the selected hospital would most likely echo conditions generally obtainable at other Nigerian hospitals. This notion was premised on the long history of the hospital and its prestige attracting experienced personnel. This factor was considered likely to promote the likelihood that research outcomes and recommendations could be transferable to other health institutions.
- The researcher's conversance with the region where the hospital was located guaranteeing some level of ease in data collection.

### **3.3 The study design**

The research is qualitative, designed to collect data through a multi-method approach. It relied on inter-personal data collection methods e.g.: semi-structured interviewing the subjects in a process open to further probing, where new concepts or interesting issues arose. This method allowed the gathering of rich data for generating understanding of the physicians' information practices and the information experiences behind those practices. The approach permitted gathering of the depth of primary data required for a more holistic and reliable interpretation of the implications of the objects' information experiences and practices.

In the views of Merriam (2002); and, Grix and Watkins (2010), qualitative research consists of non-numerical methods that emphasise obtaining knowledge about the objects being investigated within defined social contexts. The qualitative method is considered the most appropriate for exploring the '*everyday behaviour*' of people (Silverman, 2013, p. 11) as was the focus of this study about the paediatricians' information behaviour.

The use of the multi-method approach was done for the purposes of ensuring triangulation of methods to produce an in-depth description, analysis and interpretation of the data. Merriam (2002) suggests that '*rich, thick description*' which provides '*external validity*', i.e., the extent to which the results may be deemed as transferable to match similar situations, is the equivalent of '*generalizability*' in qualitative studies (p. 29). Triangulation is basically employed because it '*compares the results from either two or more different methods of data collection (for example, interviews and observation) or, more simply, two or more data sources*' (Mays and Pope, 2000, p. 51). This study used four methods to collect data: semi-structured interviews, participant diaries, observations and social media chats.

### 3.4 Outline of the methodological framework of the study

The methodological approach for conducting this study is described as follows:

Table 2: Methodological basis for conducting the study

Epistemology	Ontology	Methodology	Purpose of study
<p><i>Interpretivism</i></p> <p>(Discursive qualitative method (Willig, 2008, p. 153)</p> <p>Seeks to understand subjective but meaningful experiences instead of placing emphasis on facts (Hennink, Hutter and Bailey, 2011, p. 14).</p> <p>Accordingly, ‘different perspectives [may] generate different insights into the same phenomenon’ (Willig, 2008, p. 153).</p>	<p><i>Constructivism</i></p> <p>‘Social phenomena and their meanings are continually being accomplished by social actors’ (Bryman, 2008, p. 19).</p> <p>Therefore, reality varies, and is both time and context bound.</p> <p>‘Social phenomena and categories are ...produced through social interaction’ (Bryman, 2008, p. 19).</p>	<p><i>Empathetic interaction / phenomenological</i></p> <p>Investigator (the subject) interacts with the objects of the investigation in order to obtain data.</p> <p>Qualitative, phenomenological study, conducted using multiple methods for collecting data.</p> <p>Thematic analysis of data leading up to the construction of interpretive narratives on the objects accounts of their experiences.</p>	<p><i>Understanding &amp; reconstruction</i></p> <p>Understanding of the phenomenon in the context studied.</p> <p>Providing guide for interventions and further research.</p> <p>Probable transfer of findings to similar contexts (i.e. external validity).</p>

Adapted from Lincoln and Guba (1985) cited in Pickard (2013, p. 7); Bryman (2008, p. 19); and, Willig (2008, p. 153).

#### 3.4.1 Epistemological and ontological underpinnings of the study

This research is social constructionist in its approach. The underlying epistemology of the study is **Interpretivism**. The study is compatible with Willig’s (2008) classification as a ‘contextual constructionist’ (p. 153) qualitative study. Contextual constructionist studies assume that all knowledge is developed within contexts and is not tied to theoretical standpoints of interpretation.

This study was designed to explore a known topic of interest to the researcher, in a context where the experiences of the objects of study about the phenomenon investigated was unknown. This scenario makes the inquiry also exploratory in nature. In line with its



*'contextual constructionist'* leaning, the study constructs narratives to generate understanding about the objects experiences of the phenomenon of interest. This was done with an interpretivist approach to their individual accounts of those experiences. A general inductive approach to data analysis was used for constructing this understanding from the accounts of the objects investigated. This follows the notion that, the beliefs and conception individuals have about phenomena and the world around them are influenced by a constant flux of intersubjective reasoning in its development (Wilson, 2002, p .2).

The study adopts the interpretivist approach in contrast with the realism/positivism approach that canvasses existence of pristine, discoverable truth, which is not subject to the researcher's interpretations. The interpretive approach of the study constructed what it believes as the reality from the narrated personal experiences of participants obtained through the researchers' interactions with them.

The interpretivist perspective has been described as an approach that relies on dialogues obtained typically from interviews and discussions to derive knowledge from the analysis of people's perceptions and experiences and to construct reality from such experiences, about the social phenomenon investigated (McQueen and Knussen, 2002, p. 202; Gray, 2004; Glesne and Peshkin, 1992).

This study is **constructivist in ontology**. The subjective nature of perception which influences understanding and beliefs (Lloyd, 2010a, p. 9) makes interpretations of the accounts of personal experiences relative. This study leans towards this relativism in the construction of social of reality (Gray, 2004, p. 16), and to analyse and provide interpretative narratives about the meaning of the data gathered from the study. In this ontological leaning, what can be known or the construction of reality was done by the researcher from the data collected through the inquiry.

The relational approach believes in the duality of truth or reality, i.e., that there can be no single truth, but that truth or reality can be constructed and viewed from different perspectives in a process of inductive reasoning. In adopting this approach, detailed narratives and interpretive framework were constructed from the themes used for analysing the data obtained from the participants.

### 3.4.2 The phenomenological case study approach

As indicated in studies conducted by Grant (2008); Henry et al. (2008); and Marshall et al. (2012) phenomenological case studies explore to provide understanding about a phenomenon through the participants' accounts of their personal experiences of that phenomenon. It has been suggested that in a phenomenological research "*the object that triggers off the essential search can be a real object or state of affairs or else something fictional*" (Camic et al., 2003, p. 246). In this study, the object that triggered the search was the 'state of affairs' over the paediatricians' information experiences and practices in their profession.

In a phenomenological case study the researcher's role is to outline the experiences of the participants in a given case (Grant, 2008, p. 1) relying mainly on the participants' understanding and narrations of those experiences. Phenomenology is one of the several methods in qualitative studies that fit into; '*Interpretivism*' as a broad approach to investigations of social phenomena (Pickard, 2013, p. 12). It could be argued that descriptions of qualitative research approach, including phenomenology, do not possess the fixed nature often associated with the realist approach. It is therefore, difficult to have a uniform definition, explanation, or illustration of any of the array of qualitative methods available (Parker, 1994, p. 1).

Conducting inquiries using the phenomenological case study approach aims at understanding '*people's everyday experiences of phenomena and how these experiences are structured*' (Wolff, 2002, p. 97). This perspective aligns with Wilson's (2002) view that phenomenology is neither concerned with testing hypothesis nor lends itself to theories compulsorily as the standpoint of knowledge generation. (p. 10).

In view of the foregoing perspectives, this study relied on the data from participants to make inferences about their information experiences and practice within the context of their professional roles. The study followed methods suggested by Gray (2004) for conducting studies using the phenomenological approach. Gray (2004) advocates using relatively unstructured methods emphasising inductive collection of data for producing '*thick descriptions*' (p. 28) of the experiences of individuals on a phenomenon in their social settings. The phenomenological case study approach:

- Emphasises inductive logic
- Seeks the opinions and subjective accounts and interpretations of participants

- Relies on qualitative analysis of data
- Is not so much concerned with generalizations to larger populations, but with contextual description and analysis (Gray, 2004, p. 28).

Limberg (2000) argues that past studies using the phenomenological approach have no manual of methods prescribing standards to be followed. The author averred that the number of interviewees ranged between 20-50 persons in previous studies, depending on the scope and depth of analysis required in each study than adherence to stipulated standards (Limberg, 2000, p. 57). Traditionally, the sample sizes adopted in interpretive phenomenological studies are small (Breakwell et al., 2006, p. 327).

Perhaps, this smallness of sample sizes owes to phenomenological studies emphasising extensive interpretation over adopting a large sample size. Due to this tradition of extensive analysis in phenomenological studies, and the constraint of time, a choice of reporting style is often made between providing exhaustive accounts for individuals or '*something more general about a group or specific population*' (Breakwell et al., 2006, p. 327). The latter reporting style was adopted in the interpretative analysis of data in this study through the researcher's construction of group-based reality from the physicians' narrations of their individual experiences.

#### **3.4.2.1 The Nigerian paediatric physicians' context**

This study focused on providing a grounded understanding of the typical information experiences and practices of the paediatric physicians in Nigeria, through constructing a rich description from empirical data provided by a small sample size. The twenty participants in the semi-structured interviews and the seven individual week-long diary records, social media chats, plus the researcher's observations, were considered sufficient to yield good thick rich data for understanding the paediatric physicians' information experiences and practices.

#### **3.4.2.2 The position of the researcher in this study**

The researcher acted as a neutral interpreter and sense-maker from the narrated experiences of the paediatricians on the phenomenon investigated. The construction of reality by the researcher was contextual and involved a process of making sense from the accounts obtained from the physicians through an inductive approach to analysis. The researcher's influence on the outcome of the study was limited to utilising his knowledge of the theory on the subject, to scaffold the production of a thick description of the paediatricians' behaviour, from the

accounts they provided. Ultimately, the role of the researcher aligned with the assertion that “*detailed description allows the broader context of social behaviours to be delineated*” (Green and Thorogood, 2014, p. 26).

Overall, the researcher made the best-possible effort to remain unbiased and avoided superimposing his personal views, or interpreting the paediatricians’ accounts out of context. However, the widely acknowledged relativity of perspectives and differences in attribution of meaning in social science discourse, underpins the interpretations made in this study. This factor implies that, the researcher does not lay claim to having produced a pristine reality about the objects of study.

Ultimately, the researcher’s descriptions and interpretations of the experiences of the paediatricians reflect his understanding of the meaning in those accounts. The researcher’s role in the descriptions and interpretations of the objects’ accounts although providing valid understanding of the phenomenon, fall into the group of social science inquiries considered as relative. The researcher submits however, that the conclusions made in this study, are adequate, plausible, and trustworthy for providing a mirror through which the investigated phenomenon in that research setting could be effectively understood.

### ***Building trust and familiarity with the paediatricians***

A phenomenological case study does not involve the researcher ‘*becoming the phenomenon*’ Jorgensen (1989, p. 63) cited in Bernard (2013), by immersing into the life-word of the objects in a bodily experience, as in a grounded theory. Nonetheless, it requires extensive interactions with the objects of study. A phenomenological study traditionally spans a considerable length of time in order to permit thick and rich data to be collected; and the researcher’s deeper understanding of the context of the study. This is also necessary in order that: i) the objects would be at ease to freely give accounts of their experiences on the investigated phenomenon, ii) the researcher would gain adequate insight into the context surrounding those accounts, and iii) the researcher would be able to adequately and correctly describe the experiences from those accounts.

The researcher recognised that achieving this level of familiarity which was required in a phenomenological investigation was essential for rich data to be collected and for the research to be successful. The researcher therefore, used various means to develop a relationship of geniality and mutual trust with the paediatricians to ensure that they were free and open to

give an unfettered and true account of their individual experiences on the phenomenon investigated.

This research was conducted in a sub-Saharan African context. In sub-Saharan Africa where the research culture remains rudimentary, the researcher ran the risk that the target population could misinterpret the motive of the research and desist from participating. The researcher has a good knowledge of the social nuances of the research setting, and with this insider knowledge, understood that people normally react with suspicion towards research. Therefore, the majority are uncomfortable when approached for access or participation in a research. The researcher had to navigate this cultural barrier in order to gain access.

The black African society is mainly an oral cultural setting, where social relationships or transactions emphasise familiarity, friendship, comradeship, and trust, ahead of conducting any business. Unlike the western societies of Europe and North America, Africa is primarily oral, communal and low-context; requiring that to gain access to, and the trust of people for participation in a research, familiarity must be established. The researcher was aware of this cultural uniqueness and worked around it in the course of the research. According to Demeke and Olden (2012), '*cultural awareness and sensitivity are crucial for the successful conduct of research in Africa, and even insiders who ought to know better can make errors and face setbacks at times*' (p. 527).

Handling this level of cultural sensitivity in a phenomenological study was demanding and challenging. This is given that; a phenomenological study depends primarily on the objects true accounts of their experiences of a phenomenon for a valid interpretation to be made within context. Achieving this requires that the researcher obtains a deep level of trust needed for participants to be open, and at ease to give unfettered and true accounts, capable of yielding valid understanding of the phenomenon investigated.

Navigating this cultural difference in Africa was also challenging in the successful use of one of the data collection techniques of the study; the diary keeping method. Getting the participants to complete diaries, a traditionally western practice, in an oral society where personal record-keeping is alien culture; required a deeper level of trust and familiarity, beyond the "cold-call" that usually characterise a survey-type research. Even in western societies, available literature indicates that the use of the diary method for conducting research is sparse; and when used, is often fraught with difficulties. The paediatricians in this study, although highly educated, were for these reasons, expected to consider the diary method as

untraditional, requiring the researcher to overcome that barrier with inter-personal relationship skills. Considering these factors, the use of the diary method was novel in the context of this research.

**The first step** taken to achieve the aim of generating familiarity and trust was to ensure that the investigative process was not a “cold call” from the researcher to the paediatricians. In this regard, the researcher made an exploratory visit to the research setting in April 2014 for the dual purpose of seeking permission to conduct the study and to converse and familiarise with the paediatricians targeted for the study.

During this month-long exploration which involved multiple visits to the hospital, the researcher met with paediatricians at various locations; their offices, consulting areas/rooms, call rooms etc., for personal introductions, explaining the research, urging participation, and to establish channels for further communication. Some of these meetings involved only brief chats lasting between 5 to 10 minutes owing to the pressure of time for the paediatricians. The exercise, however, proved essential in ensuring that the paediatricians understood what the study was about and what it would be used for. Overall, the paediatricians became less apprehensive over participating in the study as a result of the understanding they gained from meeting with the researcher, observing him in and around the hospital in various locations.

#### ***Identifying ‘Champions’ for the study among the paediatricians***

**The second step** involved identifying the ‘*Champion*’ (Harrison, et al., 2011) who would anchor the research. One of the ways to overcome barriers of obtaining consent is to use someone influential within the organization as a *champion* to reach other participants as the key informants and mobilisers of support. In the course of speaking with the paediatricians during the exploratory visit, the researcher identified those who showed a keener interest on the study than others, in order to make them the Champions or arrow heads for reaching out to their colleagues. The notion of ‘*Champion*’ (Harrison, et al., 2011) envisages interested individual who possesses influence and knowledge of an organization and who actively supports a study or project within their organization.

The head of the Paediatrics Department showed a keen interest on the research and played a Champion role in galvanising the participation of paediatricians through repeated encouragements at the clinical meetings. Another Champion the researcher identified from the chats during the exploratory visit was the co-ordinator of the resident paediatricians. This

paediatrician was the first to be interviewed and a Champion that constantly urged his colleagues to participate in the study. These key informants consistently encouraged their colleagues to participate in the study particularly during their clinical meetings.

### ***Integration into the paediatricians' environment***

**The third step** taken to ensure that there was familiarity and trust was the researcher's regularity at the research setting spanning well over thirty visits. Over the course of collecting data in the two phases of the study; interviews and diaries, the researcher was constantly at the hospital engaged in activities such as: negotiating interviews, conducting interviews, making observations, having casual interactions with the physicians, and chat with the librarians. The frequency of the visits allowed the researcher to actively integrate into the environment of the physicians, to the point of starting to appear less of a visitor and more as a "part of the furniture" and a regular member of staff. Casual chats often took place with the physicians around the clinic areas and their offices on many occasions in those periods. The researcher however, was careful to avoid hampering the paediatricians in their daily patient care routines. The personal observations the researcher made in the course of this lengthy immersion into the paediatricians environment, and the resultant interactions with the paediatricians, ultimately provided useful insight for writing the narratives to reflect the context and reality of the accounts obtained.

### ***Altruistic approach in working with the paediatricians***

**The fourth step** which the researcher used in ensuring that a cordial relationship and geniality was established with the paediatricians was to work within their convenience in all schedules and interactions. Physicians are traditionally time-constrained professionals, and every paediatrician at the hospital alluded to having this constrain. The researcher worked within the physicians' schedules and convenience and did not try to impose his preferences. This method entailed very long waits for appointments to be kept by the paediatricians, often resulting in re-scheduling of several cancelled appointments.

### **3.4.3 Justifying the phenomenological approach for this study**

First, the position of Parker (1994, p. 8) that "*there is no one correct qualitative research method*", underlies the researcher's assumption in the choice of approach for conducting this study.

Second, the belief that there is a thin line that separates different qualitative approaches has been underscored by Bernard's (2013) classification of **ethnography**; an approach for studying cultural values and practices within societies, as '*good phenomenology*' (p. 21). According to McQueen and Knussen (2002):

"ethnography is concerned with describing social groups or situations; delineating, for example, behaviours and shared beliefs of a particular group of people, and through this gaining an understanding of how and why the participants function and behave as they do within their culture" (p. 198).

Jorgensen (1989, p. 63) cited in Bernard (2013) suggested that in ethnography the researcher attempts '*becoming the phenomenon*' in a process of deep penetration, and complete immersion into the life-world of the objects, in order to accurately describe the '*insiders' experience of life*' (p. 329).

This esoteric level of bodily involvement by the researcher for obtaining data, as obtainable in ethnography, was neither the intention of this study, nor was required for adequately and accurately describing the experiences of the physicians on the phenomenon.

Third, this study was not aimed at discovering new theory from data as is the case with a **grounded theory** approach. The conduct of this study was not premised on the assumption of independence from the literature as claimed by grounded theorists. The grounded theory approach rejects a premise on the literature and existing knowledge in a subject field, as a standpoint of creating new knowledge. The method strives to build theory '*about how things work*' in social contexts, through a series of intensive coding of primary data (Bernard, 2013, p. 525).

The aim of this study was to provide understanding of physicians' experiences on a known subject matter; i.e. their information experiences and practices, as premised on existing literature, through insight gained from their personal accounts. Gray (2004) infers that the phenomenological approach suits the provision of a rich description of people's experiences on a subject matter within a social context. This is similar to Bernard (2013) who states that:

"A phenomenological study, then, involves trying to: (1) see reality through another person's eyes; and (2) writing convincing descriptions of what those people experience rather than explanation and causes" (p. 21).



This study was conducted following these postulations of Gray (2004); and, Bernard (2013). The study had no element of evaluation, and therefore, was also not designed as an **action research**. Action research is usually intended for the evaluation and assessment of activities that impact on people within a social environment. Action research normally involves the active participation of the researcher (Parker, 1994). In the further view of Parker (1994) action research is “*designed to create social and individual change by altering the role relations of people involved in the project*” (p. 111).

Assessing the extent to which an intervention activity had altered roles and/or behaviour; which is the main objective of an action research, was not the intention of this study.

### **3.5 Data collection**

This study focused on generating depth of description from a multi-method qualitative case study owing to the paucity of knowledge about the phenomenon in the setting studied. Doing a multi-method study in this setting was necessary for acquiring first-hand data from participants, suitable for providing reliable information capable of yielding adequate understanding of the subject of interest. Data for the study was collected across a period of time and the entire process is fully shown in section 3.5.1.

#### **3.5.1 Data collection timeline**

Paediatric physicians in one tertiary hospital located in the South-eastern part of Nigeria were studied through data collected in two phases. Semi-structured interviews and observation were conducted during the first phase of data collection for the study. The second phase of data collection which obtained self-reports from participant diaries and social network chats were conducted a year after the first phase. The entire timeline for the data collection is shown in figure 19.

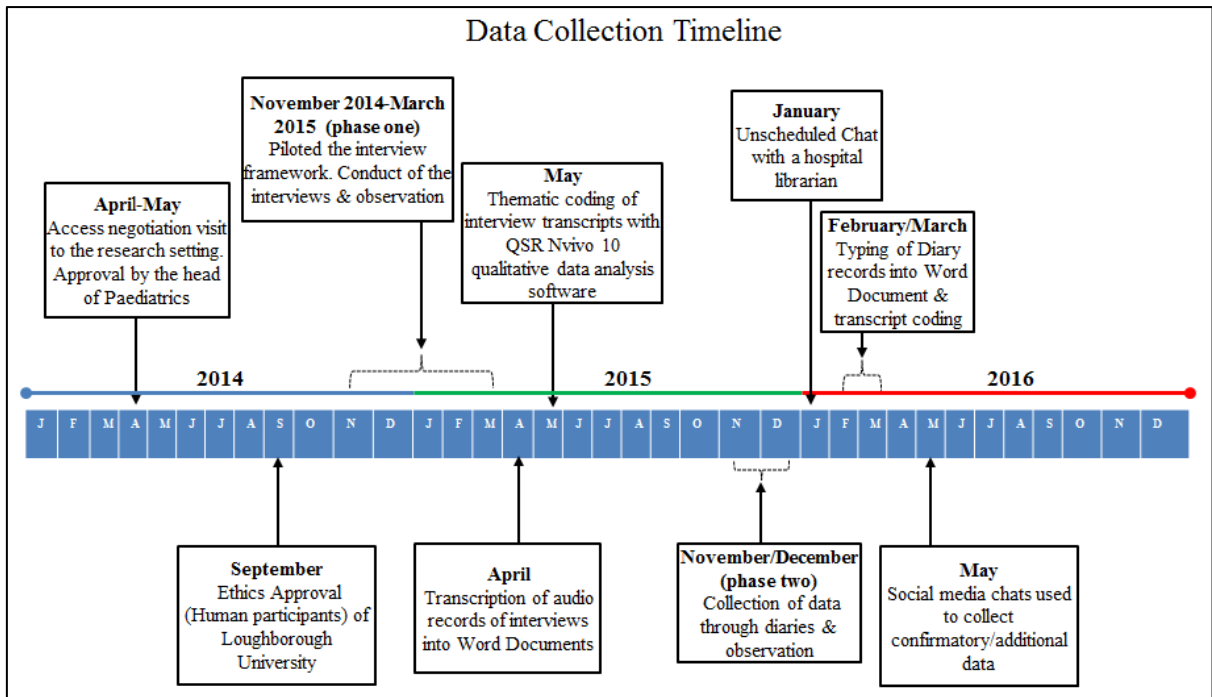


Figure 19: Data Collection Timeline of the research

### 3.6 Data collection techniques

The multi-method data gathering process used in this study consisted of semi-structured interviews, participant informant diaries, observation, and social media chats.

#### 3.6.1 Gaining ethical approval

Approval was received from the head of Paediatrics Department of the hospital who had the authority to grant access<sup>1</sup> during the researcher's exploratory visit to the hospital in April 2014. The study was done at the hospital after the receipt of this required approval (see Appendix 1 for correspondence with the Head of Paediatrics).

Institutional approval for the conduct of the study was obtained in September 2014 from the Ethics Approvals (Human Participants) Sub-Committee of Loughborough University (see Appendix 2).

#### 3.6.2 Negotiation of access for the conduct of the study

##### Institutional access

The researcher paid an exploratory visit to the research setting at the early stage of the study. During this visit which took place in April 2014, the researcher solicited for institutional

<sup>1</sup> Research proposals are not required to go through the hospital ethics committee process if the study did not involve patients directly

permission and sought the consent of physicians to participate in the study. The visit was deemed necessary to ensure that the study met ethical requirements and to ensure that problems of access to personnel did not arise and that the study could be conducted within the scheduled time-frame.

The research setting being a hospital in a developing world context, where awareness about the importance of research was not high, heightened the probability that difficulties could be encountered when seeking access and participant consent. Reports in studies conducted in developing world contexts have often inferred the lack of interest in research requests at both the individual and organizational levels.

Additionally, response to electronic mail correspondence in countries of the developing world have been documented as poor due to factors such as inadequacy of technology, electricity problems, low ICT skills and a prevalent negative attitude. Owing to this scenario, the researcher's physical presence at the research setting was considered more important for obtaining institutional permission and participant consent for the conduct of the study.

### **Participant consent**

Once permission from the head of the Paediatrics Department was obtained, the researcher sought to recruit paediatric physicians to participate in the study. This participant recruitment was done through face-to-face chats with the physicians over several visits to the hospital. The researcher informed those contacted about the purpose of the study, length of time participation would take, and solicited their consent to participate. The contacts yielded consent of twenty-six physicians who agreed to participate in the study. Immediate consent was not obtained from all the paediatric physicians who the researcher sensitised on the study during this exploratory visit. Also the researcher was unable to make physical contact with two of the physicians who were on leave at the time.

When the first phase of data collection began with the semi-structured interviews, participants were asked to sign the informed consent form (see Appendix 3). The researcher assured the participants that their identity in the research report will not be compromised and that their anonymity would be guaranteed.

### **3.6.3 Design of the interview schedule**

The interview schedule was designed with guidance obtained from the literature reviewed on related studies and input from the research supervisors. The interview questions were semi-structured (see Appendix 4). This design afforded the researcher opportunity for open and in-depth exploration of interesting comments made by interviewees within a guided format of discussion. Questions contained in the interview schedule were intended to explore the paediatricians' information experiences and practices from their professional schooling to time in health care practice. Gray (2009, p. 370) suggests the use of semi-structured interviews enables the researcher to elicit more detailed and clear responses and is best suited for a phenomenological approach concerned with the meanings that people ascribe to phenomena.

Ultimately, achieving the broad aim and objectives set for the study was the primary focus in the construction of the interview questions. The process of constructing and rephrasing the interview questions was done along with the review of relevant literature in the first year of the researcher's study.

### **3.6.4 Piloting the interview schedule**

The interview schedule was piloted with three physicians in a group interview comprised of two house officers and a resident who was excluded from the main interview. The purpose of piloting the interview schedule was to ascertain whether prospective interviewees would understand the questions and whether there were interview questions that needed to be rephrased. The researcher subsequently used the information obtained from this activity to refine some of the interview questions, enabling better understanding for the interviewees.

### **3.6.5 Selection of the interviewees**

Limberg (2000) argues that the selection of interviewees in a phenomenological study is deliberately non-random as it is guided by the researcher's interest in exploring people's various ways of experiencing a phenomenon; and interest in a particular context or situation (p. 57).

In this study, the researcher's interest in paediatricians as a distinct professional group meant that the target group was purposively chosen at the inception of the study. Participation in the study was open to all the paediatricians at the selected hospital who were from the ranks of residents and above. Setting this limit that excluded house officers, resulted from insight

which the researcher gained from piloting the interview schedule. The responses given by house officers during the pilot of the interview guide, revealed that they did not possess enough level of experience, needed to elicit reliable data for describing the phenomenon being investigated. Given this discovery, the researcher decided to exclude house officers from the study.

Overall, the participants in this study were self-selecting in giving their consent individually. The researcher neither had nor exercised any preferences in the choice of participants for inclusion in the study within the delineated group of paediatricians, except on the basis of relevant experience, as stated.

### 3.6.6 Participant demographic information

An overview of the demographic information of the paediatricians who participated in this study is presented as follows:

Table 3: Demographic characteristics of participants of the study

<b>Participant data</b>	<b>Total participants = 20</b>		<b>Total at hospital</b>
<b>Gender</b>			
Female	9		
Male	11		
<b>Rank</b>			
Consultants	3		5
Senior Registrar	1		4
Registrars	2		5
Residents	14		19
<b>Rank</b>	<b>Female</b>	<b>Male</b>	
Consultants	1	2	
Senior Registrars	1	-	
Registrars	2	0	
Residents	5	9	

The hospital has a total number of thirty-three paediatricians in the ranks of residents to consultants (*source of population figure: Head of Paediatrics Department of the FMC, Umuahia*).

Of the thirty-three, twenty participated in the semi-structured interviews: the first phase of the research (see Table 3). Seven paediatricians of the twenty participated in both phases of the study by also keeping Diaries; in phase two of the research. The paediatricians who took part in this study were all tenure staff of the hospital.

Paediatricians in four positions that provided data were in a top-down hierarchical order: consultants, senior registrars, registrars and residents. The female participants in the semi-structured interviews were 9, spread across the four different positions, but had majority in the junior rank with 5 residents taking part. The male participants were 11 and equally had more resident paediatricians with 9 taking part. The participation of more resident doctors generally reflected their higher numbers on the roster of paediatric physicians employed at the hospital.

### 3.6.7 Semi-structured interviews

Twenty semi-structured interviews were conducted with paediatric physicians who consented to participate; with participants drawn from four different ranks (see table 4 for a description of the interview participants and length of interviews).

**Table 4: Description of the interview participants**

<b>Interview serial number</b>	<b>Rank of interviewee</b>	<b>Gender</b>	<b>Interview time</b>
1	Resident	Male	50 minutes
2	Resident	Male	45 minutes
3	Resident	Male	49 minutes
4	Registrar	Female	51 minutes
5	Resident	Male	48 minutes
6	Resident	Female	43 minutes
7	Resident	Male	57 minutes
8	Resident	Male	35 minutes
9	Resident	Male	56 minutes
10	Resident	Female	1 hour
11	Senior Registrar	Female	52 minutes
12	Registrar	Female	47 minutes
13	Resident	Female	45 minutes
14	Consultant	Male	54 minutes
15	Consultant	Female	1.05 hours
16	Resident	Male	47 minutes
17	Resident	Male	50 minutes
18	Resident	Female	49 minutes
19	Consultant	Male	1.10 hours
20	Resident	Female	43 minutes

The interviews took place on different dates and at multiple venues within the hospital. The researcher made over thirty visits to the hospital. Some of the interviews were rescheduled entailing that new appointments were made.

On average, the total interview time with participants ranged between thirty-five minutes to one hour ten minutes, yielding approximately a total of 17 hours of recorded conversation. It is worthy of mention however, that conducting interviews for this length of time from a time-constrained, time-conscious group, such as the in-practice paediatricians of this study was substantial and unparalleled in this context. The work-induced pressure of time on the paediatricians increased the importance of having achieved twenty interviews from a target population of thirty-three for this study.

All of the interviews were conducted face-to-face by the researcher and were voice-recorded with the consent of the interviewees, using a digital voice recorder. The interviewees were informed of what the transcripts of the interviews were meant for, their right to request for the transcripts to verify how representative it was of their views and their choice of withdrawing all or part of the data they had provided.

#### **3.6.7.1 Critical Incident Technique (CIT) method in the interviews**

One method used to probe the information practices of the participants during the interviews, was through the use of the critical incidence technique. This technique was developed by Flanagan (1954) as a method to capture sufficiently significant human activity that can permit inferences to be drawn from the actions of the observed actors (p. 327). '*Critical incidents or major events can constitute self-contained descriptive units of analysis*' (Patton, 2002, p. 439), and is used to encourage participants to recollect events in the actual ways they occurred (Bradbury-Jones and Tranter, 2008, p. 400), therefore eliciting '*aspects of best and worst practices*' (Irvine et al., 2008, p. 41). The critical incidence technique aims at '*collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems*' (Flanagan, 1954, p. 327).

The critical incidence technique was adopted during the interviews to explore the physicians' information practices in specific cases when they required information to support the process of health care delivery to patients. It was used as a tool to gain understanding of the physicians' perception of the significance or impact of their information practice on the outcomes of patient care since critical incidents are aspects of human behaviour capable of

affecting those involved either positively or negatively (Silén et al., 2012). The critical incident technique requires some basic attributes to be complete.

“For a critical incident report to be effective and useful, three important pieces of information must be included: (a) a description of a situation that led to the incident, (b) the actions or behaviours of the focal person in the incident and (c) the results or outcomes of the behavioural actions” (Anderson and Wilson 1997, p. 90 cited in Kempainen, 2000, p. 1265).

One of the questions asked during the interviews as part of this technique was:

Think to a particular case over the past few months that you remember, when you needed information for managing a particular patient;

- What led up to that situation?
- How did you get the information?
- How did you use that information?
- What happened after you used the information?
- What helped that process?
- What hindered the process?

This questioning strategy meant to facilitate the recollection of events as they occurred was important for establishing the link between the physicians’ conscious use of information (their information actions in the process of patient care) and the perceived outcomes of that patient care process. In the critical incident technique, Kempainen (2000, p. 1264) suggests that *‘the behaviour [of the actors] described in the incident plays an important or critical role in determining an outcome’* [emphasis added].

Although the wordings of the questions varied due to the unstructured nature of the interviews, and the need to probe certain important and revealing comments that emanated in the course of the interview, some key elements probed in every interview for more in-depth data were:

- Asking participants to explain what their information needs were in the context of patient care
- Asking them to narrate how information was useful to them within that context
- Asking them to narrate what they do in order to obtain information
- Asking them to recount the means through which they learnt or still learn how to obtain and use information relevant for patient care



- Asking them to narrate what enabled or hindered those learning experiences
- Requesting them to narrate how they use information during patient care
- Getting their perspectives on implications of people's information practices for patient care

At the end of each interview, the researcher uploaded the audio file of the semi-structured interview into a computer. The transcriptions were done through the interview audio files from the computer. The transcription process subsequently involved listening carefully to the uploaded files while typing the actual words of the interviewees into a Microsoft Word document.

### **3.6.8 Participant Diaries**

This qualitative research involved the use of a multi-method approach in the data collection, with participant diaries as one of the methods. This diary method; phase two of data collection required the physicians to record personal information activities related to work role performance and self-improvement on a daily basis, was used to obtain self-reports<sup>2</sup>.

Collection of the phase 2 data from the physicians was done between November and December 2015. In order to ensure the success of this phase, the researcher paid visits to the hospital within this period to distribute the diary schedules to consenting participants, monitor progress and collect the completed diary sheets. By prior arrangement the researcher contacted some of the participants regularly by text messages to remind them to complete their diaries. This was done in order to ensure that participants entered their information activities into the diaries on a daily basis.

#### **3.6.8.1 Design of the diary**

The design of the diary was guided by readings from the literature which in summary suggested that providing instructions for the participants was necessary to keep diary notes relevant to the study's objectives. Instructions on the information required in the diary were stapled in front of the log sheets to ensure that the physicians were properly guided.

The researcher provided participating physicians with plain diary entry sheets so as to ensure that daily recordings were open to the details considered necessary by the entrant (see Appendix 5).

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<sup>2</sup> This was the second phase of data collection

### **3.6.8.2 Purpose of the participant diaries**

Using the diary method was considered useful for the purpose of triangulating results with other sources of data for the research. Data from the diaries were also useful for analysing the occurrence of deviations in already established perspectives from the interviews, repetitions which could imply emphasis and certainty, hesitation which could imply uncertainty, and the emergence of useful new perspectives.

### **3.6.8.3 Selection of participants for the diary-keeping process**

The method used to choose participants for the diary keeping was self-selection by participant consent. This method was used because it was considered the best means to guarantee consistency of recording the diary. The researcher established channels of communication with majority of the physicians during the first period of data collection through which he solicited people's participation in keeping the information activity diaries. He maintained contacts with the consenting clinicians in the period leading up to the diary keeping which contributed to building a good relationship, resulting in a fair degree of participation.

### **3.6.8.4 Completion of the participant diaries**

Each participant was required to make daily recording of the information activities in which they participated for a minimum of one week, including when they worked on weekends (see Appendix 6 for the records from participant diaries). The initial plan of the researcher was for all consenting participants to keep the diaries within the same dates so as to compare what was done by each person in the same period. This plan was changed however, when it became obvious that several participants were unwilling to adopt the same time frame as others, due majorly to pressures associated with patient care and administrative roles. The researcher accepted that start dates could vary for each participant provided entries in the diary were for a week. Owing to the modification on uniformity of entry dates discussed above, the analysis of data collected from the diaries de-emphasised the use of dates.

Ten physicians initially agreed to participate in keeping the diaries and were given the diary log sheets by the researcher. Of the ten, three completed the diaries for seven days while four others made entries for six days. Ultimately, seven participants completed and returned their diaries. The returned diaries were from one consultant, one senior registrar and five residents. The unreturned diaries were from one consultant (who gave her reasons as too busy schedule and stress), one registrar and one resident (who relocated within the period).

### **3.6.9 Observations**

The head of the Paediatric Department at the FMC hospital gave oral approval for the researcher to make the observations in the clinic, call rooms and departmental library as, and when he required gathering data. The observations were conducted in the different units of Paediatrics Department between November 2014 and March 2015, and also between November 2015 and January 2016, covering both phases of the data collection. In total the researcher acted as an observer on more than thirty occasions, totalling approximately 51 hours. The areas in which observation of clinicians took place included; the consulting areas, the departmental library, call rooms, doctors' lounge, and the seminar room.

As part of gathering observatory data, the researcher also carried out an unscheduled chat with the hospital librarians on the 21<sup>st</sup> of January 2016. This took place inside the hospital library. The reason for the unscheduled call for collecting observatory data was purposively done to increase the chances that views were uninfluenced. Data from the chat enabled the researcher draw comparisons between the information given by the paediatricians about the hospital library/librarians and the librarians' perspectives. This observatory chat lasted for about 30 minutes.

The researcher's field notes were used to record all of the observations.

### **3.6.10 Social media chats**

The researcher conducted chats in May 2016 on social media with some of the paediatricians who took part in the study, using the Facebook Messenger Application. Using this medium enabled the confirmation of some of the findings that emerged from the analysis of data and to obtain additional information that was useful for validating interpretations made.

## **3.7 Methodological challenges**

The methodological barriers which the researcher faced during the conduct of this study were as follows:

### **3.7.1 Permission and access to participants**

The major methodological challenge faced in the conduct of this research was obtaining access. Obtaining access was negotiated at two levels; a) the institutional access, and, b) individual participant consent.

In using the interview technique in a study, a critical question Green and Thorogood (2014, p. 111) suggest to be considered is *'how does a researcher get people to agree to be interviewed?'* In this study, the researcher encountered some polite refusals and noncommittal responses when trying to convince the physicians to participate in the study during the exploratory visit. This challenge aligned with Green and Thorogood (2014), who further stated that obtaining *'access to professionals can sometimes be particularly challenging'* (p. 112). This challenge appears more heightened with healthcare professionals such as physicians, due to work pressure.

### **3.7.2 Working within the clinicians' schedules**

During the process of data collection from November 2014 to April 2015, there were several postponements and cancellations owing to the pressure of time constraints on the physicians. On most of the occasions, the physicians had extended clinical hours or had some other exigencies like emergencies and clinical reviews to attend. Access to the resident doctors was particularly challenging because they were preparing for their residency examinations combined with their clinical activities during the first stage of data collection.

An over four-month period was used for data collection during this first phase of data collection which allowed unforeseen changes to schedules, i.e. re-arranging interview times to suit the clinicians' schedules. The planning of this timeline was done at the initial stage of designing the data collection, and this helped to ensure that thick rich data was obtained.

### **3.8 Thematic Data analysis**

This research as a phenomenological case study, adopts the analytical schema of *'description-reduction-interpretation'* (Lanigan, 1998, p. 148, cited in Wolff, 2002, p. 97) to interpret the subject matter. In this data analysis process:

“the initial procedure consists in the description (interviews), followed by reduction (thematizations), and interpretation (hermeneutic reflection). The description is the explication of conscious experience; ... Description is taken through phenomenological reduction – finding emergent themes in the description of the phenomenon....Reduced elements are then interpreted to explicate what is signified, what the meaningful directedness points to (pp. 97-98)”.

Data from the study were analysed using the interpretive approach. Phelps et al. (2007) suggest that:

“Descriptive/interpretive research approaches seek to gain insight into the human phenomenon or situation under study and to provide a systematic and illuminating description of the phenomenon, but don’t explicitly aim to generate theory. In this type of research, analysis will involve: examining a text for topics or themes; breaking the text into segments that represent instances of that theme, and attaching to each a keyword or code; bringing together segments of text that deal with the same theme” (p. 209).

### 3.8.1 Transcription, coding of data, and generating themes

The interview transcripts coding and data analysis done in this study utilised a modified version of Braun and Clarke’s (2006) six stage method graphically illustrated in figure 20.

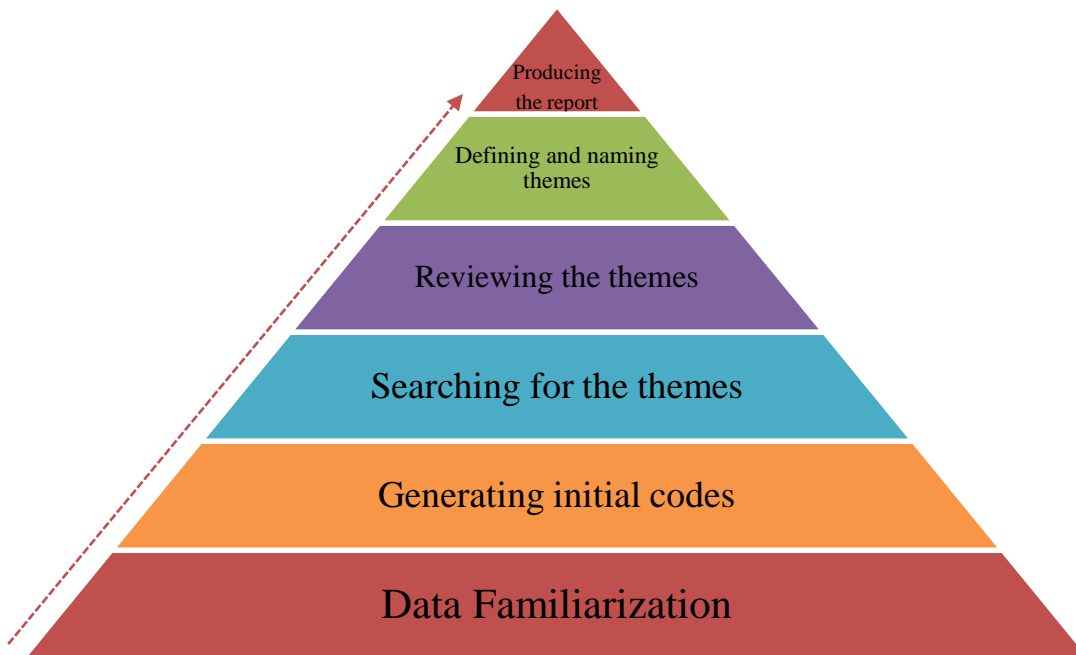


Figure 20: Braun and Clarke’s (2006) six stage method

Braun and Clarke's (2006) six stage method was modified by the researcher and used for analysing data to suit the context of this study. The modification used is shown in figure 21.

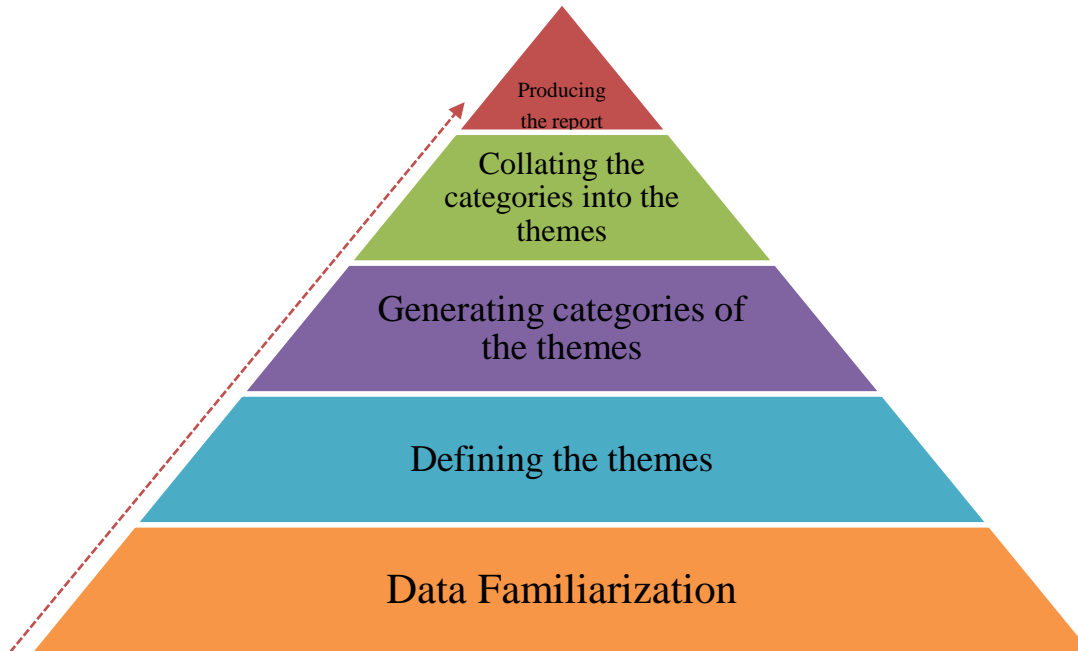


Figure 21: Adaptation of Braun and Clarke' (2006) six stage method

### **Stage one: Data Familiarization**

The data transcription process afforded the researcher opportunity to re-engage with the data in order to become familiar with its contents (see Appendix 7 for examples of one coded and one plain transcript). The voice records of the interviews done with a digital voice recorder were transcribed into text by the researcher in April 2015. The transcription yielded a total of 92 pages of textual data. On the average, each interview yielded about 6 hours of transcription, totalling approximately 120 hours in all from the 20 interviews conducted.

The process afforded the researcher the opportunity of re-engaging with the data after the interviews. This opportunity was significant for refreshing the memory of what transpired during the interviews and useful for familiarising with the contents of the interview files.

Furthermore, familiarity with the interview data was increased by printing the transcripts for repeated reading. This helped to cross-check transcribed data against the audio files for correctness of transcription. It was also useful for checking that each transcript was ascribed to the correct interviewee and subsequently assigned a code. This process of data screening and familiarization took one week to complete, with notes made about potentially useful ideas emerging from the transcripts.

### **Stage two: Defining the themes**

Themes represent the units of analysis for providing answers to the questions in a study (Braun and Clarke, 2006, p. 89). The choice of themes was guided mainly by the literature and study objectives. This was done to ensure that the focus of the study in achieving the objectives was maintained. Generating themes for the analysis was necessary because themes are *'the units of analysis'* from which the data is interpreted for meanings and associations in relation to the topic (Braun and Clarke, 2006 p. 88).

The themes used for analysing the data emerged through a review of the literature. Although this research was exploratory in the context where it was conducted, several studies have been conducted in the past in the field of information behaviour in other contexts, yielding useful knowledge for generating the themes. Given that the researcher possesses knowledge of the theory on the topic which was the basis for developing the objectives of the study, there was no need “re-inventing the wheels” in searching for new themes. Five themes: information experiences; information needs; information use; information seeking behaviour; and, information literacy needs, were, therefore, drawn from existing literature as the *'labels'* (Boyatzis, 1998, p. 31) for conducting the interpretative analysis.

The literature sources of the themes are as follows:

- Theme one: Information experiences
  - Theme two: Information needs
  - Theme three: Information use
  - Theme four: Information seeking behaviour → Hepworth (2007, p. 42)
  - Theme five: Information literacy needs Lloyd → (2010a, 2010b)
- } Cho (1998) cited in Detlor (2003, p. 116)

### **Stage three: Generating categories of the themes**

Two transcripts were randomly selected from the interview data set for more intensive search in order to generate concepts to be coded for deriving categories or sub-themes of the five themes. After reading the two transcripts more intensely several key concepts from those transcripts were highlighted in a keyword-in context (KWIC) method. These keywords and phrases were assigned identifiers. Coding of the data using this method was done to highlight the relevant concepts which could become categories of the selected themes. (See appendix 7). The researcher ensured that every interesting idea capable of adding meaning to, and within the context of the study was highlighted.

The highlighted words and comments made by the interviewees were inserted into the most appropriate theme categories, following Saldana's (2013) views. Portions of the actual words of the participants were inserted verbatim as quotes under these categories. Outlining these actual words under the categories and most appropriate themes was done from as many interview statements as were considered related to the theme. The process implied that at the completion of the coding of the transcripts, direct quotations of the participant's statements were available under each theme and sub-theme for use during the interpretative analysis of data.

The categories generated were further analysed to eliminate those not having sufficient data to support them or were too diverse and more appropriately merged with other categories. Care was taken to ensure that data coded under each of the themes fit properly with the context of the interviewee accounts. In the course of assigning comments of every interviewee to appropriate theme categories from all the transcripts, several interesting concepts which emerged were used to modify initial theme categories or sub-themes, where appropriate. Some of these emergent words, concept and phrases similar in meaning to existing categories were merged to form new ones. This modification continued throughout the process of the transcript coding.

Deciding on how to rephrase the highlighted words or concepts into appropriate encompassing terms was influenced by the researcher's background theoretical knowledge on the subject, and the objectives of the study. In making decisions about the codes, where words or concepts were similar or had the same meaning, the most appropriate words or phrases were used to represent the whole.

Suggestions made by Hughes, Wareham and Joshi (2010 p. 438) were used to resolve duplications and overlaps by merging duplicate concepts in one broad term or phrase. In following this process, the entire data set was treated as possessing equal value in a procedure which Merriam (2002,) described as '*horizontalization*' (p. 94). Horizontalization is:

“The process of laying out all the data and treating the data as having equal weight; that is, all aspects of data have equal value at the initial data analysis stage. Data are then clustered into themes, and repetitious statements are removed [from individual themes] (p. 94)”.

The categories that emerged from the process are shown in figure 22.



Nodes			
Name	Sources	References	
Application of information to patient care	2	2	
Benefits and perceived implications of information use for patient care	18	35	
Facilitators of individual information experience	10	17	
Factors affecting physicians' information experience	1	1	
Forms of information accessed by the physicians	2	2	
Hospital's support for physicians' information experience	19	45	
Information capacity building needs	12	23	
Information needs	4	9	
Methods used for information capacity and knowledge building	2	4	
Necessity of information resources availability for patient care	7	11	
Physicians' information seeking behaviour	16	50	
Points of information access	0	0	
Sources used for medical information	9	19	

Figure 22: The categories developed in the coding process

#### Stage four: Collating the categories into the themes

The fourth stage involved placing the categories (i.e. inclusive of sub-themes and sub-sub-themes) into the appropriate themes (see Appendix 8 for the screenshot of Nvivo 10 detailing this process).

#### Stage five: Producing the report

The interpretation of the data was done using the themes and sub-themes to construct the narratives. This is explained in the following sub-heading.

### 3.8.2 Interpreting the data with the themes

Ultimately, the themes were used to analyse the data as contained in chapters 4 and 5.

Thematic analysis is '*a foundational method for qualitative analysis*' according to Braun and Clarke (2006, p. 78). In Braun and Clarke's further view, thematic analysis:

“can be an essentialist or realist method, which reports experiences, meanings and the reality of participants, or it can be a constructionist method, which examines the ways in which events, realities, meanings, experiences and so on are the effects of a range of discourses operating within society...thematic analysis can be a method that works both to reflect reality and to unpick or unravel the surface of 'reality' (p. 81)”.

The analysis utilised a general inductive approach (Thomas, 2010). The inductive approach is a systematic procedure primarily using detailed readings of raw data to derive concepts,

themes or models from the interpretations of the raw data by the investigator (p. 238). In order to achieve internal consistency in the interpretations, interview extracts were used to discuss the themes when writing the narrative. The narrative was the sense made out of each theme, the underlying story of the theme and the interpretation of the reality through it. To ensure that the data analysis process resulted in the construction of a good narrative, graphic models of the themes are used throughout chapters 4 and 5; in analysing the data.

# Chapter Four

## Analysis of Interview Data

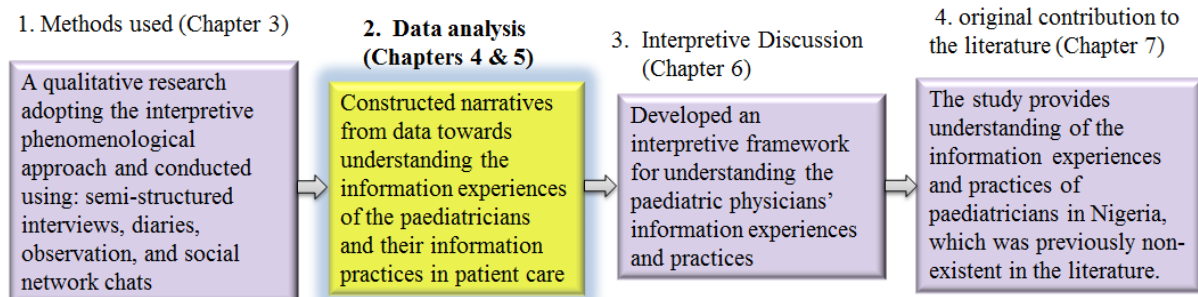


Figure 23: Method of interview data analysis

### 4.1 Introduction

This chapter focuses on the analysis and interpretation of the data collected through the semi-structured interviews in the context of answering the questions posed in this research.

Following the broad aim of this study which was to provide an understanding of the information experiences of paediatric physicians in Nigeria and their information practices for patient care, the data analysis provides answers to the following research questions posed in chapter one:

1. What information experiences do paediatric physicians in Nigeria have?
2. In what ways do paediatric physicians in Nigeria engage in information practices towards patient care?
3. Does the paediatricians' information experience have implications for their information practices and patient care?

The analysis was premised on the themes guided by their diagrammatic representations, including those of the sub-themes. Using the themes was necessary for conducting the analysis based on a broad view of the results from the data. This permitted the connectivity of concepts to reflect the interplay of ideas within the data, enabling interpretations to be drawn towards achieving the specific objectives of the study.

## **4.2 Structure of the analysis**

Two information behaviour models discussed in the literature review in chapter two were considered useful for providing a structure to the analysis of the data. The models are in figures 7 and 8.

Hepworth's (2007, p. 42) model on information behaviour abstraction in Figure 7 of page 34, was used to discuss the clinicians' information experiences, because it was considered suitable for explaining these experiences as they occur in a situated context. The three levels of people's information behaviour as explained in the model consist of the local social context, the individual context and the wider cultural context. Another basis for its use was that it provided a good platform for discussing the various levels at which people encounter information, in a manner considered adequate for achieving the objectives of this study.

Similarly, figure 8 of page 35, presents the general model of information use by Cho (1998) cited in Detlor (2003, p.116). The three domains in Cho's model used for the analysis were: i) information needs, ii) information seeking, and iii) information use. The model's three domains were adopted to structure the analysis of the information practices of the paediatric physicians. Cho's model was used because its suggestion of the three domains echoes the views of many contributors to the topic of people's information practice. It appeared as a point of convergence on the information practice debate, and therefore, considered best for predicating that aspect of the analysis.

Using these models provided the structure for the analysis and was aimed at providing the safety of not working in interpretive isolation. It also created a platform and basis for using the findings in previous research to reflect on specific discoveries made about the objects of this study. The aim was to provide a basis for a presentation order, so as to maintain a coherent, meaningful pattern in the flow of thought. Additionally, the process of analysis was done with the cognisance that the Interpretivist basis of the study was not deviated from in the discourse. This was ensured by the use of themes as the main units of the interpretative analysis.

## **4.3 Themes**

The following five themes which emerged through the literature were used in analysing the interview data:

- Theme one: Information experiences
- Theme two: Information needs
- Theme three: Information use
- Theme four: Information seeking behaviour
- Theme five: Information literacy needs

A screenshot of these themes from the Nvivo 10 coding template is shown in figure 24. The re-arrangement of the order in which the themes appeared in the coding template during the analysis, was aimed at following the order in which themes relate to the research questions posed in chapter one.

Nodes			
Name	Sources	References	Created On
Information experiences	1	1	13/05/2015 17:08
Information literacy needs	12	23	26/05/2015 17:19
Information needs	4	9	13/05/2015 17:05
Information seeking behaviour	16	50	26/05/2015 17:10
Information Use	2	2	13/05/2015 17:12

**Figure 24: The themes of the study**

The screen shots of the various sub-themes that emerged during the coding are presented in the appendices as Appendix 4, except for the theme; information literacy, which had no sub-themes.

In the analysis of data contained in this chapter, graphical models of the themes and sub-themes which were generated using the Nvivo 10 were used for the interpretations and to guide narratives on the data. This was done in conjunction with other types of graphical representations which were not generated using Nvivo 10, where these were considered better for conducting the narratives.

#### **4.5 Theme one: Information experiences**

The data analysed under this theme contributed to answering research question 1:

- What information experiences do paediatric physicians in Nigeria have?

#### 4.5.1 The local social context

The hospital work environment provides the paediatricians with their everyday local context of work life, within specific individual work roles. The local social context affords the physicians the information environment with which they consistently engage with and which in turn shapes their information experiences in several ways. The paediatricians' hospital work place represents their local social context of everyday life.

This local social context involves the spectrum of work-role information activities in which the physicians participate on a constant basis at the hospital. It consists of all the affordances within, or provided by the hospital for enhancing the information activities of the physicians. Defining the local social context within this limit, owes to the fact that the paediatricians' patient care duties necessitate their constant participation in the hospital-dominant information environment.

Clinicians were asked to narrate what they thought promoted or inhibited their capacity within the hospital in accessing and using medical information. The views elicited from this question tend to suggest that the provisions made within the hospital context had effect on people's information experiences. The provisions available for the clinicians' within their local social context is shown in figure 25 and discussed under.

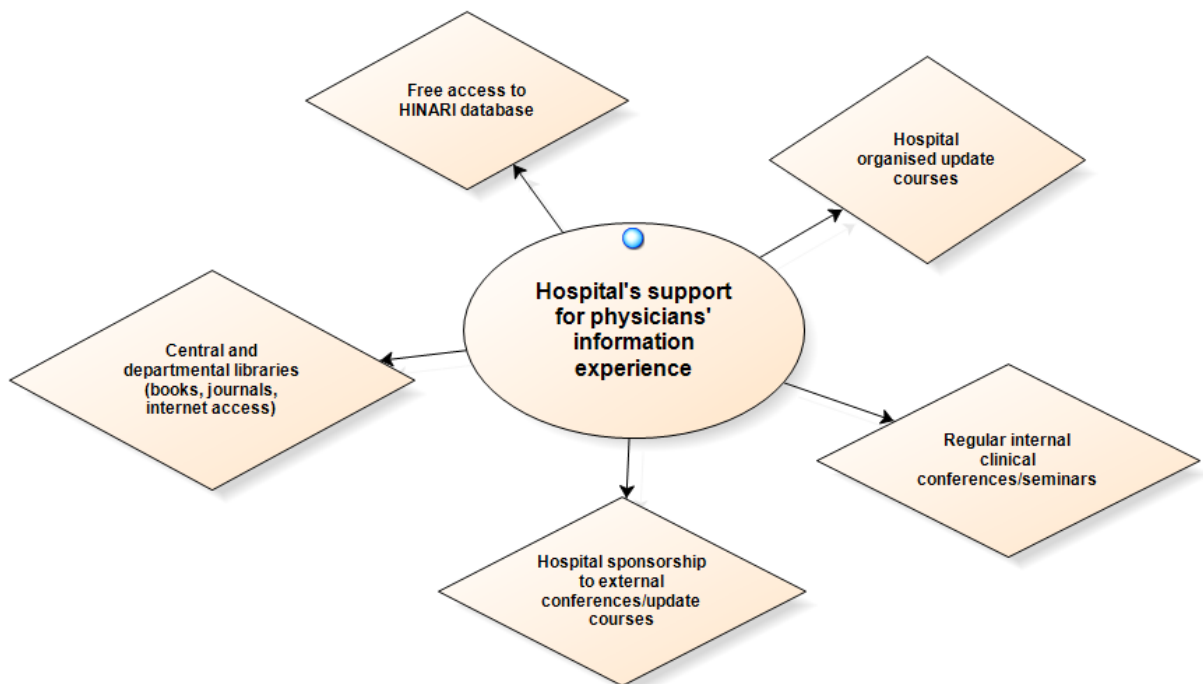


Figure 25: Support provided for the paediatricians information practices

#### 4.5.1.1 Hospital and Departmental libraries

The services of the hospital and departmental libraries were part of the information services through which the hospital endeavoured to support the information experience of the physicians. There were however, many dissenting comments among the paediatricians about the lack of effectiveness in the services provided by these libraries in meeting their information needs. The service rendered at the departmental library was adjudged by some clinicians as deficient and dysfunctional due to the fact that it lacked the services of a qualified librarian and was, also in their view, not sufficiently stocked with resources to guarantee depth and variety:

*“The resources we have are limited. We need more current books in the departmental library”* (Interview 20. Female, Resident).

*“We don’t have books outside of paediatrics at the departmental library, but there are times when you need information that is not in paediatrics”* (Interview 20. Female, Resident).

*“The paediatric department library does not have a librarian [...]”*. (Interview 17, Male, Resident).

The clinicians expressed contrasting views on the existence of an e-library within the hospital however. While some clinicians believed there was an e-library already in existence at the hospital, others disagreed by suggesting that the hospital should establish one. The existence of what some described as e-library at the hospital was however, not confirmed by the observations of the researcher at both the departmental and main hospital libraries. What the hospital provided was access to the internet at both libraries.

What is apparent from the comments by the clinicians’ was their eagerness to see that the hospital ensured effectiveness of their internet services in the support of people’s access to information:

*“The internet service is limited to the hospital library at the moment with very poor network connectivity. That is a big limitation to searching information from online sources”*. (Interview 18, female, Resident).

*“We had access to the internet and that helped but sometimes the network connectivity is poor”* (Interview 14, Consultant, male).

The majority perceived the hospital library’s internet access provision as eccentric and unreliable. The predominant feeling among the physicians was that library services at the central and departmental level was very necessary for providing information support for their work-roles. The

common perception was that the provision of internet and other electronic access to information by the two libraries, coupled with adequate information resources availability, was very paramount for enhancing clinicians' access to medical information.

There were a few others though, who expressed a measure of satisfaction with the hospital library in meeting their information needs:

*“In our department upstairs there’s an internet service that’s free and then there’s a library there upstairs that’s functional [...]”*. (Interview 3, Male, Resident).

*“We presently have internet connectivity in the departmental library [...]”*. (Interview 20, Female, Resident).

*“There’s the hospital library and e-library with internet connectivity”* (Interview 4, Female, Registrar).

Expressions like ‘very important source of information’<sup>3</sup> ‘very helpful’<sup>4</sup> ‘gives us support’<sup>5</sup> and ‘useful help’<sup>6</sup> underscore some of those physicians’ perception of the value and contributions of the hospital library service to their information needs. How significant the hospital library was to these physicians in solving clinical problems was expressed by one interviewee:

*“[...] sometimes questions might come up that are a bit outside your field, that is when you need the bigger hospital library [...]”*. (Interview 2, Male, Resident).

Additionally, the paediatric department library was primarily established to augment the services of the hospital library in providing resources for the paediatricians. The existence of this information service seemed to have been contributing in some way to the information needs of the physicians albeit with contrasting views about the significance and quality of its service as well. A few interviewees described the departmental library approvingly while the majority did not:

*“We have a very rich departmental library and an e-library in the department, so you can actually access all the information you need both on the hard copy and software and the internet as well”* (Interview 1. Male, Resident).

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<sup>3</sup> Interview 9

<sup>4</sup> Interview 6

<sup>5</sup> Interview 7

<sup>6</sup> Interview 2



*“We also have a departmental library where people go to source for information and it has internet connection. We have our own code for the HINARI database where people access research works and current literature [...]”*. (Interview 13, Female, Resident).

*“We have more recent books in our own departmental library [...]”*. (Interview 15, Consultant, Female).

There was a broad range of views that highlighted the factors within the hospital that impacted the physicians’ information experience and what the hospital needed to do to improve the information environment. The prevalent views centred on the need to improve the information service provided in the hospital basically through the employment of more *qualified* librarians at the hospital and clinical libraries:

*“I am not sure if I am in the position to suggest they should employ more qualified librarians, but they should do what is necessary to improve the system”* (Interview 11, Senior Registrar, Female).

*“The paediatric department library does not have a librarian; it is only the hospital that has librarians in the hospital library”* (Interview 17, Resident, Male).

One participant noted the need to improve on a factor considered a potential discouragement to people from using the hospital library at the very onset of their contact with the system:

*“The protocol for registering with the hospital library is very rigorous and not everybody might have the patience to complete that process”* (Interview 9, Resident, Male).

What was evident from the perceptions expressed by the paediatricians’ whether in approval or disapproval was people’s recognition of the importance of the hospital library, as an information agency necessary for meeting their information needs.

#### **4.5.1.2 Free Access to the HINARI database**

Another factor within the local context of the physicians meant to influence their information experience was the hospital’s provision of access to the HINARI database. The HINARI; Access to Research in Health Programme is a World Health Organization project developed to facilitate the Health Inter-Network by the United Nations in 2000. The project provides access for low and middle-income nations to *‘one of the world’s largest collections of biomedical and health literature’* (World Health Organization, 2015). The free availability of the HINARI for the physicians owed to the consideration of their local context as qualifying for free access being located in a middle-income developing country.

Additionally, participating institutions in the HINARI project were required to provide high speed internet connectivity to enable access. This requirement of high speed internet

connectivity was unfortunately not adequately met by the hospital in the view of many disapproving physicians.

The provision of this information service at all within the hospital, confirmed the local availability of baseline internet connection capable of enabling access, albeit not at high speed, and appeared as a cushion for the economic cost of personal information resources provision for a few physicians who used it, because:

*“[...] those journals and textbooks in HINARI are free for us”* (Interview 19, Male and Consultant).

#### **4.5.1.3 Hospital-organised update courses**

A range of responses seemed to suggest that the update courses organized locally by the hospital afforded physicians the opportunity to acquire medical information useful for practice. The few available courses appeared to provide supportive information experience which the physicians needed to keep up-to-date and to retain their licences:

*“[...] about two or three years ago, the Medical and Dental Council of Nigeria raised the issue of CMEs, that is, continuing medical education. The hospital is involved in organising some of these CMEs [...]”*. (Interview 8, Male, Resident).

*“The medical association here organises what we call continuing medical education and doctors are expected to participate so they could get information on current issues in managing patients”* (Interview 19, Male and Consultant).

*“...for a doctor to renew his licence he must engage in what we call continuous medical education [...]”*. (Interview 9, Resident, Male).

The importance of such update courses to the information experience and knowledge of the physicians was explained by one interviewee:

*“Updates and conferences [...] reveal new methods for doing things”* (Interview 6, Female, Resident).

However these events are sparse and not held as frequently as could effectively support the knowledge building experiences and the information practices of the clinicians. According to most of the clinicians, one reason always advanced by the hospital for this factor was budget constraints due to insufficient funding by the government.

#### **4.5.1.4 Internal clinical conferences and seminars**

Nearly all the physicians reported that medical information sharing was facilitated locally within the hospital by the clinical meetings, conferences and seminars organised by

department of paediatrics. Majority felt that those activities provided very important means of obtaining medical information that facilitated personal development, effectiveness in patient care and uniformity of practice:

*“[...] the paediatric department of this hospital also has a means of circulating information to the doctors. Each day we always have a means of sharing information, there’s always a programme and internal conferences to share ideas among ourselves...we also have ...update courses where we are updated on the current thing in the field of paediatrics”* (Interview 6. Female, Resident).

Making individual presentations during the seminars and conferences provided the residents a means of evaluation and knowledge acquisition for their programme. The individual presentations afforded a forum for knowledge sharing on personal discoveries and reports about the procedure taken during patient care. These reports were analysed by other colleagues and the consultants:

*“[...] basically in the training in an average of once in one month or once in two months you are required to make a presentation, which actually of course is part of your training. With that, everybody has gained that capacity to source for information”* (Interview 1. Male, Resident).

*“[...] a lot goes on in a typical day when we do ward rounds. So what happens is that the resident that took the call documents everything and will do a formal presentation where we take a critical look at what was done. We look at everything; the way you presented your history, your confidence and choice of words because that’s what the exams they take entails. Also your treatment options and why you did what you did”* (Interview 19, Male and Consultant).

The process provided inspiration for people to engage in individual information search, as well as a learning opportunity. One resident admitted that the opportunity for learning from others provided by those internal activities was so important that there was nothing to be shy about. He said; *‘I am not shy of learning from them what they [his colleagues] have discovered’*, in the process of each person making presentations during the seminars (Interview 5, Resident, Male).

#### **4.5.1.5 Hospital sponsorship to external conferences**

Although many felt that the hospital provided limited opportunity to attend external seminars, workshops and conferences through sponsorship, there was a consensus that attending those activities provided information experience useful for practice. By listening to the opinions of their colleagues in those fora, the physicians picked up useful information for reflecting on their own knowledge and practice:

*“[...] some of the things you thought you knew when you hear from another person you find out that in fact there is a deficiency somewhere”* (Interview 2. Male, Resident).

*“When we attend conferences and workshops we get a lot of information, especially conferences that are tailored towards sub-specialties, you get information about your own sub-specialty [...]”*. (Interview 15, Female, Consultant).

Every interviewee tended to emphasise that his or her information experience and knowledge was improved by those internal and external opportunities for interactions and knowledge-sharing. These activities were either hospital-based (internal) or hospital-sponsored (external) programmes.

#### **4.5.1.6 Information Resources**

The information resources provided in the hospital library were generally perceived as lacking depth and currency in coverage. The majority described this lack of depth and variety of the information resources in the paediatric department library as a limitation to obtaining required medical information. A clinician said that the resources are *“...mainly centred on paediatrics”* and therefore:

*“When you want to check up something outside of what you have in the departmental library at the moment, that constitutes a problem”* (Interview 2. Male, Resident).

This lack of depth and variety appeared to hamper willingness and satisfaction of the physicians in using the departmental library resources. Normally people show discontent when faced with such unwelcome limitations, but this feeling appeared stronger among the resident doctors, some of whom commented with a tinge of annoyance:

*“The departmental library is somewhat empty as the major books you’d expect to be there are not there. A library should have the major textbooks and the others that you can cross-check with, but this is not the case in our departmental library. I think the hospital should look into this problem of resources because it is a very important aspect of our training”* (Interview 10, Female, Resident).

*“We don’t have books outside of paediatrics at the departmental library, but there are times when you need information that is not in paediatrics”* (Interview 20. Female, Resident).

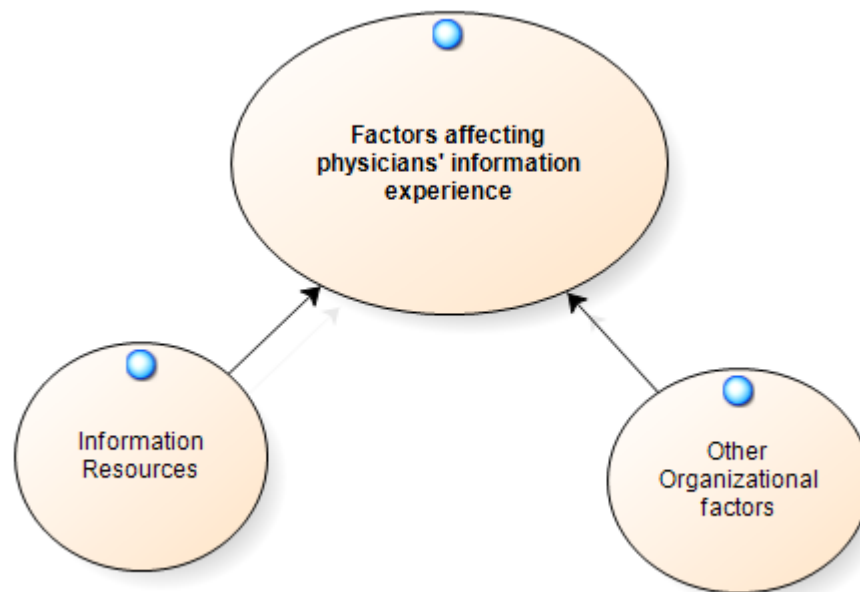
The shades of perceptions by two interviewees on this factor reflected individual valuations of a system’s effectiveness. The varied opinions were reflective of the paradox of a half empty and half full glass:

*“The resources we have are limited. We need more current books in the departmental library”* [Half empty perception]. (Interview 20. Female, Resident).

*“Our departmental library offers a little bit of help with current paediatric books, but they are few”. [Half full perception]. (Interview 18, Female, Resident).*

One interviewee’s position seemed to reconcile these shades of opinion. Though emphasising the problem of lack of currency, the availability of a few helpful resources was implied in his view:

*“Some of the books we need are not available and many that are available are not the current ones” (Interview 14. Male, Consultant).*



**Figure 26: Local context factors of the paediatricians' information experience**

#### **4.5.1.7 Other Organizational Factors**

The lack of digital access to information at the organizational level within the hospital, forced the physicians into making personal provisions for computerised and internet-aided access to information sources which they needed for their work. Clinicians’ canvassed for a change in the hospital’s processes to become computerised as the means to ensuring effective services:

*“[...] and also I think the hospital needs to be computerised to stop the carrying of file and paperwork. You know the folders carry the information. You need to gain quick access to people’s folders to know their case history, and the manual system gives a problem on this because of the frequent misplacement of folders” (Interview 3, Resident, male).*

*“Everything is just personal. The hospital’s internet access is not functioning well” (Interview 12. Registrar, female).*

*“Many of us depend on their laptops and tablets for internet connectivity [...]”*. (Interview 17. Resident, male).

It was obvious that the desirability of having a free-access internet service within the hospital for the staff was generally accepted among the interviewees. The cessation of this important service once provided by the hospital was described with disapproving terms because it was perceived as hindrance to obtaining easy access to information.

Similarly, there were suggestions from interviewees showing preference for a change from analogue to digital mode of operations in all routines within the hospital. Explanations made by interviewees in support of their resentment of the analogue-paper-based system was because of the system’s slowness of information exchange, and information loss due to misplacement of files.

Participants perceived the non-computerization of hospital routines, particularly the non-implementation of an electronic health records system as impediment to their having an effective information support system that enhances patient care. Physicians felt that this was a major hindrance to their access to information useful for making decisions. This perception dotted the discussions on the necessity to improve the effectiveness of the supportive information environment for effective delivery of patient care. The clinicians’ position underscores the growing acceptance of modern information and communication technology and preference for the adoption of digital processes in the hospital’s routines:

*“We need an e-library because that has become the norm everywhere. We no longer need to carry books about. That’s what needs to be done...”* (Interview 3, Resident, male).

*“I wish the internet will be made available in the ward, in the clinic, wherever you are, so you can always key in and find out information. So we need availability of information at all points of services, like in the clinic there’s a computer system to use and in the wards, as you are doing ward rounds, you have systems where you can get information”* (Interview 15, Consultant, female).

*“Currently on a hospital-wide basis we don’t have free access to the internet and that is a missing link in information access. If the hospital can provide ready access to the internet that someone can easily log into and have access to information; that will improve the situation much”* (Interview 16, male, Resident).

*“Apart from carrying your books around, internet accessibility in the hospital is also a key factor whereby anywhere you are in the four corners of the hospital, you should be able to access information”* (Interview 1, male, Resident).

The participants noted that a basic problem within the hospital was the response to the provision of services that impact on staff effectiveness. They described the lack of a hospital-wide internet service for the staff as retrogression:

*“Initially the hospital used to have a free internet access but now we don’t have such. It is our own personal internet subscriptions that we use [...]”*. (Interview 10, female, Resident).

*“We used to have an internet access for the hospital but it is not working now”* (Interview 11. Senior Registrar, female).

*“We had access to the internet and that helped but sometimes the network connectivity is poor”* (Interview 14. Consultant, male).

Another organizational factor that seemed to have affected the physicians’ information experience was the limited opportunities for attending conferences and workshops. As two interviewees suggested:

*“[...] people should be encouraged by sponsoring them to conferences and workshops”* (Interview 17. Resident, male).

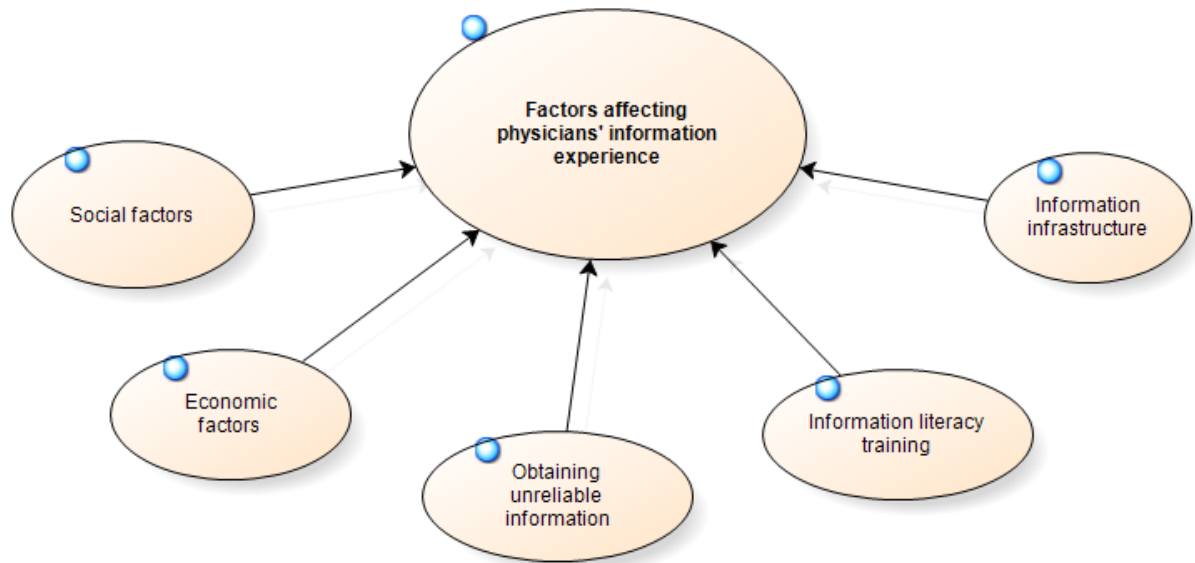
*“The hospital needs to increase its sponsorship of people to trainings both within and outside the country. If people attend [...] they can share the information they got with others”* (Interview 14. Consultant, male).

In general, the physicians regarded the limited sponsorship to workshops and conferences by their hospital as a denial of opportunity for acquiring valuable information experience from interactions with other colleagues outside of their immediate local context at the hospital.

#### **4.5.2 The wider social context**

The wider socio-cultural context represents the broader domain within which the physicians encounter information that shaped their information experiences. This context involves the different information experience spheres within society that hold aspects of the physicians’ information needs.

The factors of the wider social context affecting the paediatricians’ information experiences are discussed in the sub-sections under figure 27.



**Figure 27: Factors affecting the paediatric physicians' information experience within the wider social context**

#### **4.5.2.1 Social Factors**

The social factors that define the information experience of the physicians could be classified into external and internal factors.

One of the problems the physicians encountered in obtaining information was the reluctance of some patients to fully share required medical history. This defective information sharing by the patients/relatives hindered the necessary understanding of their illness, in order to give them appropriate treatment. One paediatrician complained that:

*“Sometimes it is really difficult to get information from patients”* (Interview 2. Male, Resident).

Another felt that language and education contributed to this barrier between the physician and patients in information sharing:

*“Many times language barrier and the parents’ level of education is a barrier to obtaining information from them. Sometimes people tend to hoard information and are not very open during discussions”* (Interview 18. Female, Resident)

This difficulty to obtain information necessary for enhancing the knowledge of the physicians about cases they handle was worsened when it was extended to soliciting people’s consent for participating in a research. Generally, people’s orientation tends towards viewing health information as private. People therefore considered some of the information demanded in research as very intrusive and would opt not to take part:



*“When it has to do with a study involving the collection of body samples, people are very reluctant to participate”* (Interview 8. Male, Resident).

In contrast to the disposition of the patients, the physicians collectively held the notion that sharing information within their group provided a basis their self-improvement. This perspective enabled the physicians to freely share information. Some of the clinicians recognised that:

*“Nobody is an island, nobody knows it all”* (Interview 2. Male, Resident).

*“[...] since you keep interacting with your colleagues and seniors you must definitely pick up useful information”* (Interview 1. Male, Resident).

Some issues that were related to the physician’s social obligations sometimes presented psychological barriers that hindered personal initiatives to information pursuit. About a physician’s ability to conduct personal research without interference from negative social factors, interviewees said:

*“In the aspect of research, it’s a little bit difficult. Research requires some abstract thinking but there’s so much pressure down here; pressure from the family and relations, financial pressure and so on. So most times the environment for that abstract thinking is not there”* (Interview 8. Male, Resident).

*“[...] family and social issues that demand your attention too.”* (Interview 7, Male, Resident).

Another factor that affected physicians’ experience with information had to do with negative social perceptions built around information access by the physician at the point-of-care. There was concern that engaging in point-of-care information access could portray the physician as amateurish, incapable and unintelligent. This tended to act as deterrent to engaging in this practice as some interviewees narrated:

*“Let me paint this picture; a child comes and you are treating the child for skin lesion for instance, I might have seen that lesion before and might have forgotten the name, or might know what the lesion is but have forgotten the treatment. If you have a book there you want to open it, and for some clients, in their minds they will say that the doctor is not capable and is not intelligent”* (Interview 19. Male, Consultant).

*“We should be seeing patients with our laptops, we should be seeing patients with our books, and we don’t do that. We have this mentality the patient will think, you will not say it, but you feel the patient might think that this doctor does not know what he is doing. The one that wrote things from his head [gap] you know there’s a lot of ignorance here [gap] is the one that people will think is more informed”* (Interview 3. Male, Resident).

A different social barrier exists with the physician’s experience of acquiring information online. The labelling associated with this was a different sort, the seeming labelling of their society in online electronic commerce. Physicians encountered barriers of non-acceptance of

payment instruments when they sought to acquire information resources from online sources. This difficulty was ascribed to the non-acceptance of electronic payment instruments such as debit and credit cards from their country, in some online publication platforms:

*“There are some times you go online to use those sources and you are asked to subscribe and when you want to make payment, the visa card you have is not listed there [...]”.*  
(Interview 13, Female, Resident).

This negative social factor was perceived as limiting the opportunity the physicians have to self-development through acquisition and use of information resources from online sources.

#### **4.5.2.3 Information literacy training**

The physicians apparently experienced differences in information literacy training they received during their respective periods of educational preparation in the medical school. The dissimilarities were on focus, content, and resources. Accounts of the physicians showed that people generally received poor information literacy preparation from their respective medical schools. None of the medical schools provided specific information literacy programmes for developing students’ ability for access and use of medical information for their future medical practice.

Some of submissions of participants when asked to describe the trainings received while in the medical school designed to give them capacity for accessing and using medical information, showed the degree of paucity of their information literacy training experience:

*“We did not have courses during my training at the medical school on how to access and use information, but I know we were always encouraged to read widely and to endeavour taking advantage of the books in the library. Well I remember a general course we did in my first year as part of the use of English which was on how to use the library and things like that but nothing specifically for finding and using resources in medicine”* (Interview 11, Senior Registrar, female).

*“That was between 1980 and 86 [period of medical training]. Back then it was just the use of the library. It was a manual thing, we had to go to the library to manually search for information. It was only at the British Council library that we had access to resources from the internet at that time”* (Interview 14, Consultant, male).

*“We did not receive trainings particularly directed at teaching us ways to access and use information for our future medical practice. I remember us doing general courses in use of the library with other students earlier on in our training and nothing more than that. Maybe I can say that some of those courses where we had to do either personal or group term*

*papers helped to push us to search for information to complete the assignments” (Interview 20, Resident, female).*

Some others, mainly through the constraint of academic work pressure, had contacts with their librarians during information search that provided them the opportunity to make use of their knowledge and skills:

*“Apart from [use of] the library I cannot remember any course that was organized. The library was made available and maybe out of interest you go in ask the librarian for what you need and they put you through on how to search for the information you need; apart from that, there was nothing like an organised course or anything like that” (Interview 15, Consultant, female).*

*“We were not given any formal training on how to search for information as medical students. What we did was a general course on use of the library together with other students from different disciplines in the first year of our training. We had class assignments that involved searching through the library for the resources there and perhaps some contact with the librarians, but nothing beyond that as per having a programme showing us how and where to get medical information” (Interview 18, female, Resident).*

*“[...] we only got information from our lecturers and from our textbooks [...] we had to go to the library on our own to seek for information” (Interview 6, female, Resident).*

For others, there was no information literacy training of any sort from their medical schools which they could remember. The pedagogical focus of their schools’ curricula did not embed training for physicians’ information competence in medical practice. What the people in this category received in terms of developing their information capability was advisory from their lecturers. For them, it was only a mere mention of the importance of information without any training activity consciously designed to expose them to good information practice:

*“[...] those days in school, not really that there was anything specific just that they mentioned importance of sourcing for information [...]” (Interview 4, Registrar, female).*

*“There was no formal teaching on how to use the library, but as a medical student then I knew what I wanted and what to look out for and during the rounds with the consultants they told us the sources that could be helpful so like that we picked up on the beneficial information sources” (Interview 13, female, Resident).*

The information literacy training provided for the students in two medical schools appeared a little different as it integrated both manual and digital information search capabilities. This was a minor departure in terms of content, from what was generally obtained in the other schools where basically manual information access methods were taught in the use of the

library courses. However, the students in one of the schools experienced limitations in their ability to engage in digital information access due to the level of available resources:

*“During the course of medical training, you know there are stages, in the first stage when we did general studies with other students we were taught the use of the library where we were taught how to search for specific information in the library, the analogue way, then we were equally taught how to go about it the digital way even though that because of the level of resources we have the digital way is not always easy”* (Interview 9. Resident, male).

One of the schools engaged in partnership with an external organization in order to teach the students digital information access methods:

*“In the medical school where I trained in Enugu at the UNTH, there was this mandatory IT training done in conjunction with AFRIHUB where they give you various strategies on how to access information, use the internet and do the basic information search things”* (Interview 2, male, Resident).

The paucity and differences embedded in the physicians’ experience of information literacy training was perceived as having bred a lack of uniformity in the physicians’ information capabilities and information practice. Two of the physicians noted that:

*“People differ [in their information practice] because not everyone has had the same kind of experience during school days in terms of what they were taught on how to access and use information and also people have different levels of motivation to explore new things”* (Interview 20, Resident, female).

*“Most of us did not have the necessary exposure in terms of training to develop our capacity to source for information independently while in school. That’s a major disadvantage for us in knowing how to get access to the information we actually need”* (Interview 5. Resident, male)

The majority of interviewees reported that the training they received from their medical schools for developing adequate information capabilities was insufficient in form, duration and content. People generally believed that at their respective medical schools, more training should have been provided toward developing their capability for information application during actual medical practice. A comment from one interviewee about having the use of the library course, ostensibly the course designed for information literacy, as a segment of another course, in their entire medical training, sums the feelings of the rest:

*“It was just a topic in one subject in a semester so you can imagine the exposure”* (Interview 5. Resident, male).

#### **4.5.2.4 Economic Factors**

The physicians' social and organizational environments, as earlier discussed, were perceived as insensitive to the provision of the training, infrastructure, personnel and resources needed by them to support effective information practice. The solution the physicians sought as a way of negotiating this dilemma was engaging in self-help in the provision of information infrastructure and resources. The resort to self-help was done at an unpalatable financial cost to the individual physicians as further discussed below:

##### **4.5.2.4.1 Provision of personal internet connectivity**

The tone of the physicians' comments revealed an apparent resentment of the financial dilemma placed on their shoulders by the self-out-of-pocket provision of internet connectivity to support information use in patient care. The physicians' recourse to this costly alternative was due to the failure of their hospital to provide an effective service in this regard. Some of them said:

*"[...] the internet accessibility is a monthly subscription and you pay for it"* (Interview 1, male, Resident).

*"It is our own personal internet subscriptions that we use and this is another hindrance in terms of cost"* (Interview 10, female, Resident).

*"[...] we have to provide internet access for ourselves and most times we run out of data"* (Interview 16, male, Resident).

*"We need internet access for 24 hours [...] if you must get the best; you have to spend more money to do that"* (Interview 7, male, Resident).

*"It is very expensive to provide personal access to the internet".* (Interview 18, female, Resident).

The intervention effort of the hospital's paediatric department through the acquisition of a modem in the departmental library for internet browsing did not provide a solution acceptable to the physicians, because of its limited service. As it was described:

*"Recently, the department got a modem that at least five or six people could log on to access the internet for information. Apart from that, there's been nothing"* (Interview 8, male, Resident).

Perhaps the frustrations associated with these difficulties explain why one interviewee demanded that:

*“The hospital should start to offer hospital-wide access to the internet”* (Interview 17, male, Resident).

In sharp contrast, not all the physicians regarded cost as a limitation to self-out-of-pocket provision of internet connectivity. The income level of people seemed to contribute to their perception of costliness or otherwise of providing personal internet connection. While discussing cost implication of self-out-of-pocket internet service provision, one consultant stated:

*“Fund would not really be a problem for me because I think that I can afford it at my level. I can afford to pay for internet access, so it’s the issue of connectivity, availability and time that are the basic things”*. (Interview 19, Consultant, Male).

One factor that seemed to add to the burden of the physicians who regarded self-internet service provision as costly was the unreliability of the service provided by the internet service providers. The speed of the service was often very slow causing apprehension, dissatisfaction, disappointment and annoyance to subscribers. Two physicians described what frequently happened to people:

*“[...] in this part of the world the internet accessibility is a problem because the internet providers are basically here for business and not customer satisfaction. So a lot of times you need to look up things and the network is so bad. What should take you split seconds to access takes you hours [...]”*. (Interview 1, Male, Resident).

*“[...] sometimes our internet service providers are so disappointing. Like now I am not browsing even though I have my data card because network reception is poor [...]”*. (Interview 7, Male, Resident).

What could doubtless be perceived by their readiness to continue to bear the pressure of cost associated with personal provision of internet access was the understanding the physicians have about the importance of access to medical information during patient care. For some, it was the combination of the pressure to gather necessary information towards passing career progression assessments and being able to perform their patient care duties. This self-help information behaviour of the physicians’ demonstrates their awareness of the importance of information access to support patient care.

#### **4.5.2.4.2 Personal subscription to journals**

The physicians’ were generally aware of the need for them to use primary sources of medical information like journals to meet their needs for information. Some of the physicians were in the practice of acquiring personal copies of medical journals which they identified as useful

for obtaining information. The cost of subscribing to the journals was another economic factor that militated against this information practice. Some of the views were that:

*“There are also some journals which are online, but the problem most times is that you have to subscribe to them to have access and that is a hindrance in using them as one wishes”* (Interview 10, Female, Resident).

*“Most of the foreign journals are very expensive”* (Interview 14. Consultant, Male).

*“[...] if you want to get a soft copy of a book or a journal [from the internet] is expensive”* (Interview 6, Female, Resident).

The factor of prohibitive cost was described as *“the problem of finance”* by one interviewee (Interview 18. Female, Resident). This *‘problem’* was perceived as a potent inhibitive factor to the physician’s quest to gain information experience needed for practice through the use of medical journals.

#### **4.5.2.4.3 Making personal provisions for books**

The cost of purchasing personal medical books was viewed as expensive by the physicians, particularly the residents, probably due to their level of income. In the view of one resident physician:

*“The textbooks are expensive [...]”*. (Interview 6, Female, Resident).

The underlying implication of the economic hindrance to access to medical information resources for the paediatric physicians was the impediment it brought to personal quest to expand knowledge, as described by one interviewee:

*“If you do not have enough funds you cannot do a reasonable research”* (Interview 8. Male, Resident).

There was generally a prevalent perception among the paediatric physicians that the information services provided in their hospital organization was deficient and unreliable. This notion contributed to strengthening the physicians’ resolve to resort to self-help for the provision of information resources and supporting infrastructure where possible, for their medical practice, irrespective of the attendant high cost.

Very often, however, despite their strong resolve, people could not afford the cost of acquiring most of the materials they considered useful for obtaining information germane to practice, due to the prohibitive cost.

#### 4.5.2.5 Information Infrastructure

The increasingly digitised information environment, and the increasingly central role of information within organizations, makes the provision of infrastructural support for effective information exchange imperative within all systems. One of such provisions is the availability of efficient digital infrastructure to support access to information from the internet.

Although the internet has become almost indispensable in all systems and for individuals because it enables easy access to information, majority complained about the unreliability and slowness of available internet services:

*“[...] the other important one is the state of internet facilities. The service is not quite reliable; sometimes the network is down and prevents your information search”* (Interview 2, Male, Resident).

*“Sometimes you want to check something on the internet and the connectivity is poor and that keeps you waiting not giving you what you want”* (Interview 6, Female, Resident).

*“We need internet access for 24 hours, but sometimes our internet service providers are so disappointing. Like now I am not browsing even though I have my data card because network reception is poor where we are. There is fluctuation of internet access, and if you must get the best, you have to spend more money to do that”* (Interview 7, Male, Resident).

These frustrations were linked to internet access provided through mobile data from telephone companies to which the physicians subscribed. The poor internet connectivity was however, not limited to the services of the telephone companies. People were not spared the disappointment also when they used the hospital library’s internet service, whenever it was available. One physician said:

*“The internet service is limited to the hospital library at the moment with very poor network [...]”*. (Interview 18, Female, Resident).

The dilemma of poor connectivity was not limited to internet service provision. Many expressed disappointment over the quality of service provided by the telephone networks for voice calls. Calling colleagues was one important means through which the physicians acquired or shared medical information among themselves. How negatively the physicians perceived the frequent inability to contact colleagues for information exchange through network hiccups was evident from these comments:

*“Sometimes the network reception is not so good to enable calling colleagues”* (Interview 10, Female, Resident).



*“Basically, the source of communication here is the cell phone. Sometimes when you wish to contact a colleague, there will be network congestion or other hiccups, so trying to contact a colleague will be a problem at that point”* (Interview 9. Resident, Male).

Some interviewees explained that telephone contact with colleagues was necessary during patient care, particularly in emergencies, because it enabled interpersonal deliberations on how to treat patient's at the point-of-care:

*“You know here internet access may not be as fast as you want it, sometimes you log in and there is network problem. What you want to access will be delayed at that moment, so many a time calling a colleague on phone and describing the nature of the illness, that is, the presentation, the signs and symptoms and what has been done so far is better”* (Interview 9. Resident, Male).

*“[...] I could reach across to my consultant on phone. I wonder what would have happened if I could not reach him at that desperate moment when I was already getting confused and worried [...]”*. (Interview 20, Female, Resident).

The state of information infrastructure as one of the factors within the physicians' wider cultural context of operation was perceived as having presented limitations to the physicians in gaining some types of information experience necessary for effectiveness in practice. One such experience lost by the paediatricians was information exchange through telemedicine, where colleagues exchanged ideas online real-time across distance, while actively engaged in treating patients:

*“There is also what we call telemedicine which could have been of tremendous help but is not available at the moment because of the level of our technological development. This would have been a very good source of expert information from consultants elsewhere [...]”*. (Interview 9, Resident, Male).

Physicians recognised that the poor state of information infrastructure and the lack of willingness by the hospital to implement technological changes to operational routines reduced the effectiveness of their service delivery:

*“The efficiency of the system needs to be improved... such as moving on to the digital way of doing things [...]if the system adopts the use of new technologies, communication among departments and units will be easier thereby reducing the time wasted in arriving at the final diagnosis in cases that need laboratory investigation”* (Interview 9. Resident, Male).

In general, the poor state of infrastructure, specifically information and communication technology infrastructure was perceived unanimously by the clinicians' as posing a serious threat to their effective access to information needed for patient care. Sometimes the clinicians require this information at critical moments during patient care where the barrier of

time wastage owing to any of the discussed factors of inefficiency critically affects the decision making process on patients.

#### **4.5.2.7 Obtaining Unreliable Information**

The confusion often posed by obtaining ‘*contradictory information*’ (Interview 6, Female, Resident) was one factor that discouraged some of the paediatricians from using information sourced on the internet. It seemed many were aware that information from open sources on the internet was unregulated and could sometimes be unreliable. This concern was often erroneously extended to any type of online information by people who did not have the capacity to differentiate between open and regulated sources.

This factor influenced the perspective and attitude of people toward sourcing information from the internet:

*“You know the internet is so wide and unrestricted and anybody can post anything on it. One has to be careful in sourcing everything from the Net as some of them may not be standard information, so I first use the sources I know are authentic and use the internet only as a support”* (Interview 14. Male, Consultant).

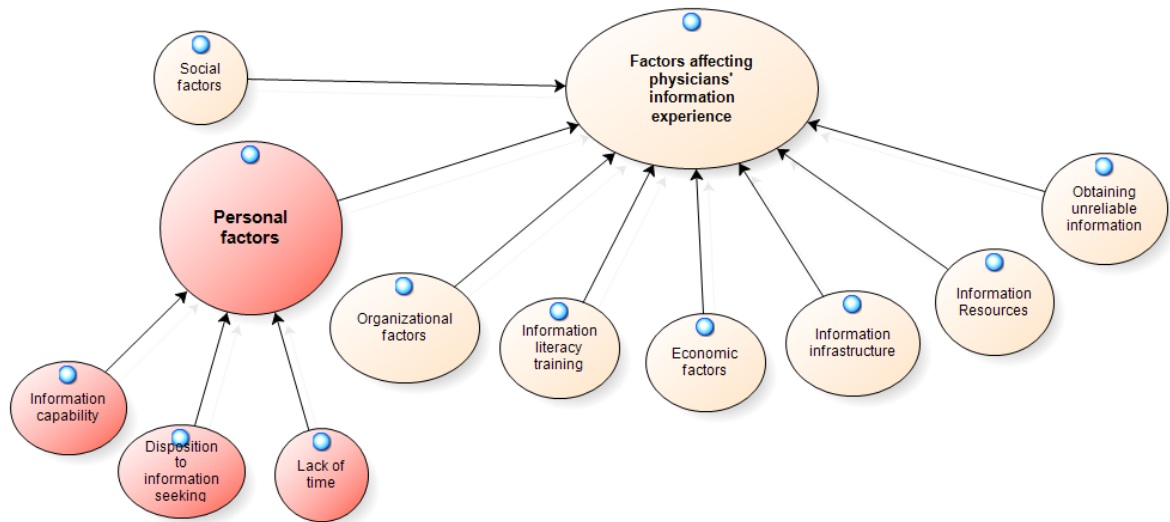
*“Some people may not want to go to the Net because they don’t trust the sites [...]”*. (Interview 10, Female, Resident).

More generally it was felt, that information from books, particularly the ‘*standard textbooks*’ were safer to be relied on for medical information. Fundamentally, people used books more as their first point reference source for medical information. This information behaviour was due mainly to their belief in the authenticity of information content from the *standard textbooks* and also because people expressed apprehension for relying on some internet sources for making decisions, notwithstanding that they searched the internet regularly. Specifically, one internet source that some clinicians admitted they would rarely use for making patient care decisions was the Wikipedia.

The concern of some of the clinicians for the trustworthiness of information content displays some level of awareness over the potential risks on outcome associated with using the wrong information to make decisions while caring for their patients.

#### **4.5.3 Individual context or Personal factors**

Certain factors associated with the individual seemed to contribute to shaping their experience of information in a number of different ways. Those individual factors are shown in figure 28.



**Figure 28: Personal factors affecting the paediatricians' information experiences**

#### 4.5.3.1 Individual information capability

The physicians' individual information capability developed from a combination of some similar and dissimilar learning circumstances, seemed contributory to their level of engagement with information activities. Consequently, it seemed to contribute to structuring some aspects of their information experience. For example, the preference for books by the majority as their reference source for medical information was not solely due to attributions of authenticity, but was intertwined with some people's lack of conversance with the internet and use of electronic sources. As one interviewee said:

*"I prefer reading books because I'm not so conversant with the internet".* (Interview 12, Female, Registrar).

The majority of those who had different degrees of internet proficiency reported that they struggled with inadequate knowledge of the sources for obtaining the medical information which they needed, when they accessed the internet:

*"I access the internet but one of the limitations I have is that I don't know too many sites and databases. It used to be only PubMed, Medscape until someone told me about Google Scholar recently. Now from time to time I use Google Scholar to get the information I need".* (Interview 14, Male, Consultant).

*"Some of us know about a few medical sources of information, but have no real knowledge on how to access and use them, especially the electronic ones"* (Interview 5, Resident, Male).

*“[...] I obviously need to know more about other sources of obtaining information and in fact being more at home whenever I try to search for information”* (Interview 8. Male, Resident).

The consequence of not *‘being more at home’* with information search on the internet seemed a limitation that plagued majority of the physicians. While discussing aspects of his information capability that needed improvement, interview respondent 5 attributed the most critical limitation to poor knowledge of internet sources for obtaining information in paediatrics:

*“I will like to improve on my ability to use internet sources, especially having adequate knowledge of accessing specific information sources in paediatrics”* (Interview 5, Resident, Male).

Others reported lack of navigational dexterity to negotiate round problems when using the internet, particularly when they encountered some *‘technical difficulties’*:

*“Some of the sources you want to open up to read on the internet, you may have some challenges trying to get them. At times you get to where they demand payment and I am not sure what to do to be able to pay online”* (Interview 6. Female, Resident).

*“The technical difficulties associated with trying to browse some sites on the Net is very discouraging sometimes [...]”*. (Interview 8, Male, Resident).

Physicians noted that the differences in people’s online information capabilities reflected on their knowledge generally. One interviewee reported her perception of the resultant effect of this differing information capability in using internet and electronic medical sources on people’s knowledge this way:

*“There are some of our colleagues that I know that they differ from others; they are always current with information because they are always online, while some others are nowhere being current. It all boils down to levels of personal interest to improve”* (Interview 15, Female, Consultant).

Possession of competence for online information access was therefore, construed as a tool for knowledge gathering that provides opportunity of being current, and was represented as a means through which people stayed ahead of their contemporaries in coping with new knowledge.

#### 4.5.3.2 Disposition to information seeking

One of the specific objectives of this research was to provide understanding of the influence of the physicians' information experiences on information practices for patient care. Analysis done under this category contributed to meeting this objective.

The personal experiences of the physicians' tended to determine their individual dispositions to information-seeking which could be grouped into the negative and positive types. Each type of characteristic displayed by the physician appeared to condition actions toward utilising information in patient care.

Negatively, the adoption and propagation of a sense of self-capability for obtaining information was one factor that appeared to determine the extent of engagement in interpersonal information sharing among the physicians. This disposition was borne out of people's assumption of knowledge and proficiency in information access, which constituted a barrier that hindered obtaining information from others. Some people would not want to be seen as incapable of obtaining the information they required, hence would rather not ask questions of others:

*"Some people might feel that asking questions is not necessary since they can by themselves read up the same information [...]".* (Interview 2, Male, Resident).

Interestingly, but perhaps damagingly, this false sense of sufficient capability was extended to relying on the services of the hospital librarians for obtaining information. This negative disposition was interspersed with a sense of undervalue of the role of librarians in meeting their information needs. Commenting in this regard about their need for the services of the hospital librarians toward meeting their information needs, these interviewees said:

*"I don't think I've ever used them [the hospital librarians] because I know the textbook I could go for and I've never found any reason to ask them for help"* (Interview 5, Resident, Male).

*"I don't think that apart from during my registration with the library that I have needed to consult the librarians for any help [...]".* (Interview 9, Resident, Male).

*"[...] for my own area in paediatrics most times I don't need them [the hospital librarians] because we have a library here, we have the internet and they may not really help me the much I want. I know what I want; they may not know what I want"* (Interview 7, Male, Resident).

*"I can't really remember having to use their services [the hospital librarians] to source my information. I do it personally."* (Interview 1, Male, Resident).

Others displayed a distinct negative attitude towards using the hospital library as an agency for satisfying their information needs, and perhaps, with a loss of probably invaluable information experience as the inadvertent outcome:

*“I am not used to visiting the hospital library [...].”* (Interview 12, Female, Registrar).

*“I personally don’t use the library quite often.”* (Interview 14, Male, Consultant)

*“I rarely use the library.”* (Interview 11, Female, Senior Registrar)

It however, appeared that the lack of enthusiasm which impeded some of the paediatricians’ use of the hospital library and the services of the librarians was connected not only with the notion of self-sufficient capability or that the librarians would not offer useful help. The physicians’ felt that the resources in the hospital library were limited in quantity, currency and scope of coverage hence would pose a hindrance to satisfying their information needs. The idea of self-sufficient capability then became the motivation for self-help through the self-provision of information resources to meet personal information needs as a routine practice by majority of the physicians:

*“[...] but most of us have our textbooks even in soft copy. So nobody depends on the institutional library for information because at best they’ll have just a copy of each book and if you are ten wanting to use it, then there will be a queue and waste of time”*  
(Interview 8, Male, Resident).

People’s career level and goals additionally seemed to accentuate their disposition to information seeking. For example, comments suggested that people seemed to relax when they had reached the top of the career ladder where the motivation for seeking information wanes considerably:

*“Some of the consultants may feel a little bit relaxed because of the level they have reached. Some of them may not be up to date with some new developments because they don’t source for information as frequently as us the residents [...]”.* (Interview 3, Male Resident).

Perhaps, the easing off in information search by the consultants in contrast to the residents was occasioned by lack of pressure for more knowledge at the level of intensity faced by residents, having attained the zenith of their career. This factor consequently seemed to breed the probability of greater reliance on experience acquired from practice over time as senior physicians, as a demonstration of their tacit knowledge, over the search for evidence. This was alluded to by interviewee 3 who added; *“but that does not take away their experience”*. The reliance on experience seemed to incubate and condition this lack of motivation for

information search until people encountered demanding challenges and complications during patient care:

*“When the motivation is not there, you may simply go ahead with what you know until you are challenged to go and search [...]”* (Interview 7. Male, Resident).

Additionally, the absence of social pressure from patients and families inclined to enforcing their rights to compensation and legal redress, when their health issues were mishandled by the physicians, was alluded to as another possible reason for this lax attitude to information seeking. This interviewee said:

*“[...] our consultants say that many times especially abroad doctors consult books, laptops and always making sure, maybe because there’s a lot of litigation over there. So that’s why they don’t want to (statement not completed) but here people escape a lot of things.”* (Interview 3, Male, Resident).

The notion of security orchestrated by the absence of social pressure because ‘*people escape a lot of things*’ combines with a sense of having reached the career apex, to explain why consultants, for instance, who are considered responsible for all patients treated at their units, could be seen as having developed the ease-off lethargy towards the evidence-search culture in caring for their patients.

While the senior physicians were perceived as being under less pressure generally, the residents who experienced the pressure of patient care together with passing their residency examinations were constrained by these factors to engage in highly committed quest for information and deeper understanding of their fields.

In contrast, therefore, the search for information solely for the purpose of enhancing knowledge for practice was construed as the ‘*business of consultants*’ by one interviewee, because of the different type of pressure on the resident physicians:

*“[...] you know as residents your primary goal is to pass your exams and go to the next level because it’s time-bound, so people see researching for information as the business of the consultants. They want to secure their positions first [...]”*. (Interview 8, Male, Resident).

These expressions suggest that the information quest culture as an attribute necessary for executing the paediatricians’ work-role activities was influenced by convenience factors, plus occasional necessity, and not the product of an imbibed characteristic which has crystalized into information consciousness reified by the totality of their information experiences.

The dichotomy in the physicians' attitudes towards exploring and using new information was underscored in the comment of one resident doctor when commenting on a question about whether he noticed any differences in his colleagues' ability to access and use new medical information for patient care. He said:

*“People differ in the ability to change from the old and accept the new. People want to stick to what they knew before and resist the new until they are sure while some people will readily accept the new. These are some of the problems of medical practice. People are so held unto the old and some are crazy about the new. But there must be a balance. It must be evidence-based for you to take anything”.* (Interview 7, Resident, male).

This suggested difference in people's disposition to the exploration, adoption and adaptation to new knowledge often precipitated other forms of behaviour that consequently influenced their information practices for patient care. Some of the factors which the physicians mentioned as influencing people's dispositions toward acquiring and using new information for patient care are further discussed.

Age was one factor which a clinician noticed as an influence on her colleagues' attitude to exploring new knowledge using a particular medium. Commenting specifically on the differences in people's disposition to digital information access, she said:

*“[...] people have different levels of motivation to explore new things. You find that in most cases the younger ones use the internet more and perhaps better than the older doctors. Well this may just be a generational thing influencing individual preferences in the sources used to get information, but what is true is that everybody here is a committed reader in one way or the other”.* (Interview 20, Resident, female).

Another factor one clinician noticed as influencing the frequency of, and disposition to exploring new knowledge by some of his colleagues' was their level of experience. While similarly discussing about the differences in colleagues ability to access and utilise new information, he said that *‘some of the consultants may feel a little bit relaxed because of the level they have reached...they don't source for information as frequently as us the residents [...]’*. The implication of this comment is that as the physicians garnered more practice experience, rising through the ranks to the highest level, the pressure to regularly rely on new knowledge from explicit sources to support patient care decisions appeared to lessen.



## **Reasons for people's disposition to information practices**

The dispositions people had towards information-seeking were discovered not to be isolated impromptu actions. Some of the physicians revealed in their comments that there were reasons behind their information practices and the choices they made about it as follows:

### ***Perception about the librarians***

Perhaps due to the quality of information service the librarians offered in previous encounters or owing to a misconception, one Senior Registrar that would not use the hospital library, felt the hospital librarians did not possess enough training required to assist her with her information needs. She said; *'I don't think there's a trained librarian here. If there is one, I have not come across the individual. I know they are skilled in keeping the books well arranged....'* She however appeared to contradict herself by concluding her argument with this statement; *'...but as I said, I don't use their services so I can't really assess them'*<sup>7</sup>.

This type of perception even if it reflects an overly severe lack of trust in the hospital librarians' qualities, was the main reason a few others gave for not relying on them over their information needs.

### ***Perceptions about and preference for information sources***

The perceptions people held about information sources influenced how they used those sources when they had information needs. For example, as earlier discussed, textbooks were the most pervasively used source of information among the physicians. The perception of textbooks as *'the final arbiter'*<sup>8</sup> or that *'the information in the standard textbooks are more reliable than what you get from the internet'*<sup>9</sup> and that *'some people may not want to go to the Net because they don't trust the sites and may prefer other texts [...]*<sup>10</sup> were strong factors that support the pervasive reliance on books as first choice source of medical information.

People's perceptions about journals, some electronic databases and some organizational social media influenced their use of these sources for keeping up to date because they were considered the best sources of current information.

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<sup>7</sup> Interview 11

<sup>8</sup> Interview 11

<sup>9</sup> Interview 12

<sup>10</sup> Interview 10

Electronic medical databases offering medical information in different formats such as books, reviews and journals were accessed when the physicians required quick information or evidence to support their patient care decisions. However, due to their limited knowledge for differentiating among electronic information sources, majority of the clinicians referred to any information acquired by means of internet connectivity as information from the internet.

#### **4.5.3.3 Lack of time**

Another personal factor which seemed critical to permitting adequate commitment and disposition of the physicians to engaging with information search for patient care was a general complaint by most interviewees about lack of time. Allusions were made to the shortage of manpower as the major contributor to a heavy patient-care-load which mortgaged physicians' time for engaging in any information activity. As interviewees revealed:

*“Here we run three units and we are not so many. This does not give us the time to go sourcing for information [...].”* (Interview 14, male, Consultant).

*“The patient load is overwhelming and does not give room for information search”* (Interview 4, Female, Registrar).

The attendant fallout of this work-load pressure is a physical strain on the physician due to fatigue. An interviewee noted that *‘fatigue limits the chances of exercising the freshness of mind to look for supporting information [...].’* (Interview 9, Resident, male).

This pressure of time constraint adversely affected different aspects of the physicians' exploration of information for patient care, for example, the limitation it posed for accessing information for use at the point-of-care was that:

*“[...] at that point you are seeing that patient; you may not have time to start searching for information”* (Interview 2, Male, Resident).

Similarly, its negative effect on the physicians' use of the hospital library was seen this way:

*“The work load in this hospital is so much that you may not have time in a whole day to source for information, we are always occupied with seeing a lot of patients to have the time to visit the library”* (Interview 10, Female, Resident).

The time factor dilemma seemed reinforced by a perception of some that engaging in information activities should stand separate from the physician's patient care role, and therefore, the *‘need to balance between’* the two. This was how this notion of duality of the physician's activities was expressed:

*“[...] you need to balance between working and seeking information. Like I told you, I am busy [...]”* (Interview 7. Male, Resident).

Interestingly, it was revealed that the constraints faced over lack of time, also affected people’s commitment to personal studies, otherwise considered as routine for a physician by many. For instance, reading medical books, which was the most frequently used source of medical information among the physicians was affected by this disadvantage. This was believed to have led to a lowering of intensity in information sourcing, to a degree dissonant with the physician’s information needs. These disapproving comments revealed people’s dissatisfaction over this factor:

*“[...] for reading books the hindrance is that many times we are overloaded with work”* (Interview 12, Female, Registrar).

*“[...] you might study about a particular thing; one year later is when you have time to study about it again”* (Interview 3, Male, Resident).

Although ‘one year later’ could probably represent an exaggerated emphasis, the point this interviewee’s notion brings, is a reification of the difficulty and frustrations faced by the physicians, over the pressure of time constraint for engaging in knowledge sourcing activities, necessary for delivering appropriate patient care.

#### **4.6 Theme two: Information needs**

The analysis done under this theme contributes to answering the second research question of this study:

- In what ways do paediatric physicians in Nigeria engage in information practices towards patient care?

During the interviews, the physicians were asked to explain what their information needs were within the context of their roles as paediatric physicians. Interpretations of the physicians’ awareness of their information needs, the reasons for the information needs, the frequency of the information needs and their reasons for information source preferences are presented in this section.

Figure 29 represents the theme **information needs** and its sub themes; awareness of need for information, reasons for information need, frequency of need for information and reasons for information source preference, among the paediatricians.

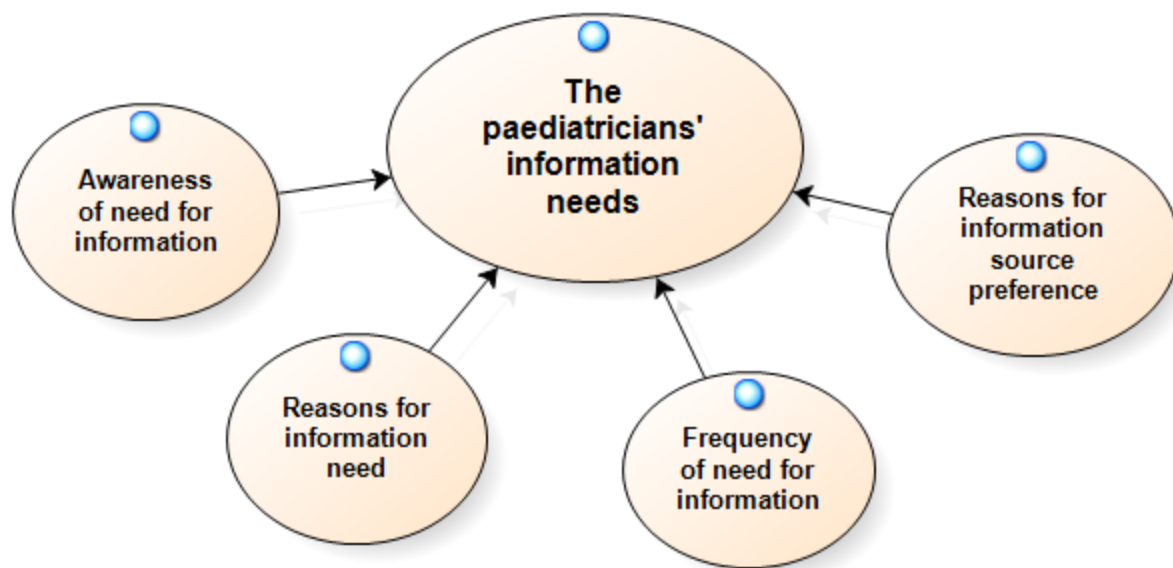


Figure 29: The paediatric physicians' information needs

#### 4.5.1.1 The paediatricians' awareness of their information need

Data analysed under this category contributes to meeting the first specific objective of this study which was to provide understanding about the physicians' awareness, perception and experience of information literacy towards patient care.

Determining the paediatricians' awareness of their need for information was necessary for gaining understanding how they engaged and made sense of their other information practices within their patient care role. The views of the paediatricians suggest that people possessed a good degree of awareness of the necessity for information use in patient care. The various views are presented as follows (emphasis in quotes is the researcher's):

Discussing how information contributes to the physician's self-improvement, interviewee 2 (male, Resident) said: ***"One cannot work without being better than he was yesterday. As I am now, I believe that before I leave here today I would have become a better person than I was through the information I will receive [...]"***. This physician recognised the need to be open to the receiving new information on a daily basis in order to continuously improve perhaps his personality and his ability for better patient care. He equally understood that engaging in self-information-seeking could cover areas of his deficiency in practice: *"[...] in paediatrics there are many fields and sub specialties, you must invest more time in any field you have a deficiency [...]"*.

Similarly, another interviewee said: *“It is true that the process of our preparation in medical school was rigorous and we can say we have some level of expertise, **but certainly what is in your brain is not enough**, so you need constant updates to remain the doctor that you are called”* (Interview 13, Resident, male).

It appears also that some clinicians were aware of the importance of engaging in evidence-based practice, which could be possible only when they obtained the right information to support it. However, there were some factors that were noted by clinicians which appeared to limit the extent to which people engaged in the use of evidence in patient care. As one consultant said:

*“You know that we are in a world of evidence-based medicine, so most of the things we do now has to be evidence-based and you need a lot of information which is the evidence that such a thing has worked somewhere before you can bring it into your own practice. So if you don’t have that information maybe because of lack of sources of information, or your sensibility to such information or even ignorance that such information exists, it’s going to really put you back because every day new things keep coming [...]”*(Interview 15, Consultant, female).

Discussing in similar vein, some physicians highlighted the importance of having the knowledge of sources for obtaining the evidence, as well as knowing what the correct information was:

*“[...] knowledge has a key role to play in paediatric practice, a very key role. You must be aware of the source where the particular information you need for something is.”* (Interview 1, Male, Resident).

*“[...] because there’s so much information out there. You need to know the one that’s correct. If you are able to get the correct information you’ll be able to treat your patients well”.* (Interview 6, female, Resident).

The physicians’ extent of awareness of their need for information for carrying out their patient care duties tend to be summed up by these clinicians who said that: *“Nobody wants to be archaic”* (Interview 4, Registrar, female), and that *“Information access and use gives the patient the best and it reduces making mistakes or assumptions about what you are doing”* (Interview 3, male, Resident). The later comment shows that the clinician believed that information use has implications for outcomes in patient care because, in his view, its non-use could lead to mistakes being made by the clinician on the patients. This view partly addresses the fourth specific objective of this study which is to provide perceptions about the potential implications of the physicians’ information practices for providing care to patients.

#### 4.5.1.2 Reasons for information need

The analysis done in this category contributes towards achieving the first and the fourth objectives of this study which aimed to provide understanding of:

- the physicians' awareness, perception and experience of information literacy for patient care; and
- the potential implications of the physicians' information practices for providing care to patients.

The paediatricians gave various reasons why they had need for information. Eight classifications of these needs were identified and presented as follows:

##### **i. Managing challenging and confusing cases**

*"The basic challenge for me is to be sure about whatever I want to do for any patient because I need to convince myself that I have not left out any option that could have worked better for that patient"* (Interview 1, Male, Resident).

*"[...]if you are dealing with a confusing scenario when the patient's presentation is not straightforward you'll want to access information at that point...about 2 weeks ago in the clinic, I had a patient that presented and I wasn't sure what it was. The patient came up with some symptoms, but I wasn't sure what I was dealing with [...]"*. (Interview 6, female, Resident).

##### **ii. Supporting diagnostic decisions**

*"...maybe I have a diagnostic dilemma and I've looked at the case and cannot really say what exactly it is, I can access the internet to verify the presentation and the symptoms [...]"* (Interview 16. Male, Resident).

*"[...] it is very important to be sure, particularly when there is decision that is hazy and one is not so clear on the most appropriate step"* (Interview 17. Male, Resident).

##### **iii. How to manage evolving diseases**

*"Diseases evolve, and as the days pass by more symptoms of that disease evolve also [...]"* (Interview 2, male, Resident).

*"[...] Things keep changing especially when it comes to tropical illnesses [...]"*. (Interview 1, Resident, male).

*"[...] every day new things keep coming. There are changes both in causes of disease and the interventions. What you may be practicing maybe like last year by this year another thing has come up [...]"*. (Interview 15, Consultant, female).

*“[...] many times things change concerning the management of childhood diseases, for example, it’s not the way asthma was treated ten years ago that it is being treated now [...]”* (Interview 16, male, Resident).

**iv. Understanding the contextual peculiarities of managing some illnesses**

*“I am usually interested in understanding how the diseases present here in the tropics because geography affects disease conditions a lot”.* (Interview 18, Female, Resident).

*“You see that most of the things you work with in terms of studies being done are based on studies done in the west. For example if they say that a drug has been working or a drug has been used, most of the studies on that drug and the clinical trials were done in the west not considering that there could be differences in terms of the genetic components of the people to make the drug work”* (Interview 8, Resident, male).

**v. Drugs and dosage information**

*“In paediatrics, the drug dosages differ according to the ages of the children and there is always this need to be sure of the amount of drug a patient should take”* (Interview 9, Resident, male).

*“The main issue that led up to that is, well the main information that we actually look out for is dosing. That is just the main thing. Most times the information I look for is about the dosage. The treatment for this disease is for so and so drug. Because we have many cases that occur commonly you know how to treat them, so dosage is the main information we look for with particular interest on the side effects”.* (Interview 3, Resident, male).

**vi. Refreshing the memory**

*“Your memory may fail at that moment to remember what you learnt back in the medical school days [...]”* (Interview 10, Registrar, female).

*“[...] there are some cases with challenging presentations or something you know but are not sure of or no longer vivid in your mind [...]”.*(Interview 5, Resident, male).

**vii. Keeping updated**

*“[...]most patients can check up what you tell them online, so if you tell them what was done in the ‘80s and they already have information on what was done in 2015, they won’t trust you”* (Interview 19, Consultant, male).

*“[...]I need to know what the current trends are, what other people in other places are doing, where the world is going to now as you cannot just stay with the old practice, you might need to verify some things and also share some of the things you are doing with others”* (Interview 11, Senior Registrar, female).

**viii. Examination purposes**

*“[...] as residents your primary goal is to pass your exams and go to the next level because it’s time-bound”* (Interview 8, Resident, male).

*“Most of us are into active reading because we are resident doctors”* (Interview 5, Resident, male).

*“[...] because we are resident doctors. There’s hunger for information from all quarters because exams are around the corner [...]”*. (Interview 7, Male, Resident).

Most interviewees believed that meeting these outlined information needs, played a major role not only in how well they managed their patients, but also how well the patients could trust them as knowledgeable and competent physicians.

One information need; the need for information to pass examinations, appeared to be peculiar to a limited set of physicians - the physicians below the rank of consultant, and specifically; the residents. This information need was necessitated by career progression requirements of the physicians in the lower ranks.

#### **4.5.1.3 Frequency of need for information**

Most of the physicians noted that their need for information was vital towards making decisions on their patients; also, that the need for information occurred as a daily factor of their work:

*“In the daily work you do, when you come to work you encounter challenges and you need to broaden your knowledge base in order to surmount those problems [...]”*. (Interview 2, Male, Resident).

*“I need information basically to support what I do on a daily basis in seeing my patients.”* (Interview 1, Male, Resident).

Besides ensuring certainty in the physician’s decision-making process on the cases presented by their patients, the physician’s daily need for information was necessitated by the need for pro-activeness and not reactiveness in the management of diseases. In this regard a clinician in the epidemiology team said:

*“I need to be constantly aware of what is happening, so I will say that it is every day that I require one form of information or the other. I do not have to wait until a child arrives at the hospital with a disease condition that’s likely from an epidemic. I need to keep monitoring the situation together with my team because that’s what my work entails. I need information on a consistent basis to do this properly”*. (Interview 18, female, Resident).

It appeared that the main reasons for the daily occurrence of information needs were for overcoming challenges during patient care, such as when complications were encountered and during confusing presentations, and the need for the physician to be convinced about decisions taken. Other reasons adduced as necessitating the physicians’ frequent need for



information were concerned with obtaining information about drugs and people refreshing their minds on forgotten aspects of previous knowledge.

Regardless of this daily need for information, not every physician engaged in information search on a daily basis to meet the needs. The search for information depended on various factors, for example, the level of challenge the case posed to the physician's tacit or residual knowledge at that moment:

*"It is not in every case that I specifically search for information. There are cases that are common and you already know what to do off the cuff, but some cases present with difficult scenario and you have to search for additional information to support whatever decision you might take eventually. What I will say is that this happens on a consistent basis, though I can also say that in some way one requires information every day"* (Interview 20, Female, Resident).

Confirming this perspective, another interviewee said that:

*"It depends on what you are managing. If it's the normal malaria fever there will be no need for extra information. But if you get some interesting or rare cases, that's when you search for additional information, maybe what is new or what you are not doing that could help in managing the patient better"* (Interview 11, Senior Registrar, Female).

In general, the main factors suggested by majority of the paediatricians as necessitating their need for information on a daily basis were: a) the occurrence of difficult, challenging or rare cases; b) being sure of decisions taken on their patients; c) following current treatment procedure for their patients, and, d) the fact that every case is unique and oftentimes cases present different peculiarities in management.

#### **4.5.1.4 Reasons for information source preference among individual physicians**

The paediatricians' awareness of their need for information in the discharge of their patient care duties appeared to have a relationship with their disposition to engage in conscious information seeking to meet those information needs. It, however, appeared that in meeting those needs, the physicians' had individual preferences and inclinations for using different information resources due to reasons adduced in the statements below.

Table 5: Reasons for physician's preference of information sources

	Reason	Quotes
1	Reliability/authenticity	<p><i>“The internet is fast and has a lot of useful information, though not everything is reliable. Books are much more reliable and serve as reference for me at all times”</i> (Interview 17, Resident, Male).</p> <p><i>“Textbooks are more reliable sometimes [...]”</i> (Interview 5, male, Resident).</p> <p><i>“For us in paediatrics we’ve termed the Nelson book of paediatrics the bible of paediatrics, so most times whatever you want to do in terms of information, you start from there. Whatever we can’t find or can’t understand from there, we then digress to other sources”</i> (Interview 6, female, Resident).</p>
2	Type of needed information	<p><i>“The source I use may depend on if I need information for treating a patient or I want to know what is going on in the communities I cover”</i> (Interview 18, female, Resident).</p>
3	Availability, accessibility, speed of access	<p><i>“[...] textbooks are usually accessible and available”</i> (Interview 5, male, Resident).</p> <p><i>“When I need medical information I first start with what is readily available”</i> (Interview 6, female, Resident).</p> <p><i>What I do depends on the circumstance because I may face some challenging situation and I call a colleague. You know here internet access may not be as fast as you want it, sometimes you log in and there is network problem. What you want to access will be delayed at that moment, so many time calling a colleague on phone and describing the nature of the illness ... is better. Your colleague will quickly let you know what he or she thinks and that will assist. Most doctors do it and that is the most instant way to access information”</i> (Interview 9, male, Resident).</p>
4	Usefulness to information need	<p><i>“Anything that gives me what I want is what I use”</i> (Interview 2, male, Resident).</p> <p><i>“[...] I can call my consultant as my first source of information because of the wealth of knowledge [...].”</i>(Interview 8, Male, Resident).</p>
5	Format of the resource	<p><i>“For textbooks, personally I prefer hard copies so I can actually make jottings [...]”</i> (Interview 1, Male, Resident).</p>
6	Ability to make comparison	<p><i>“I also searched the internet because it helps you understand how such cases have been treated elsewhere”</i> (Interview 4, female, Registrar).</p> <p><i>“[...] when we needed to compare what we saw with what was in the literature; we had to go to the internet”</i> (Interview 1, Male, Resident).</p>
7	Scope covered by resource	<p><i>“[...] for American Academy of Paediatrics, the reason is that most topics are discussed in details with some clarity. I use the Nigerian Academy of Paediatrics Journal, because it’s tropicalized and contains basically things that concern us here. That covers up the part where the American Academy of Science wouldn’t, then Medscape is for general knowledge in paediatrics”</i> (Interview 8, Male, Resident).</p>

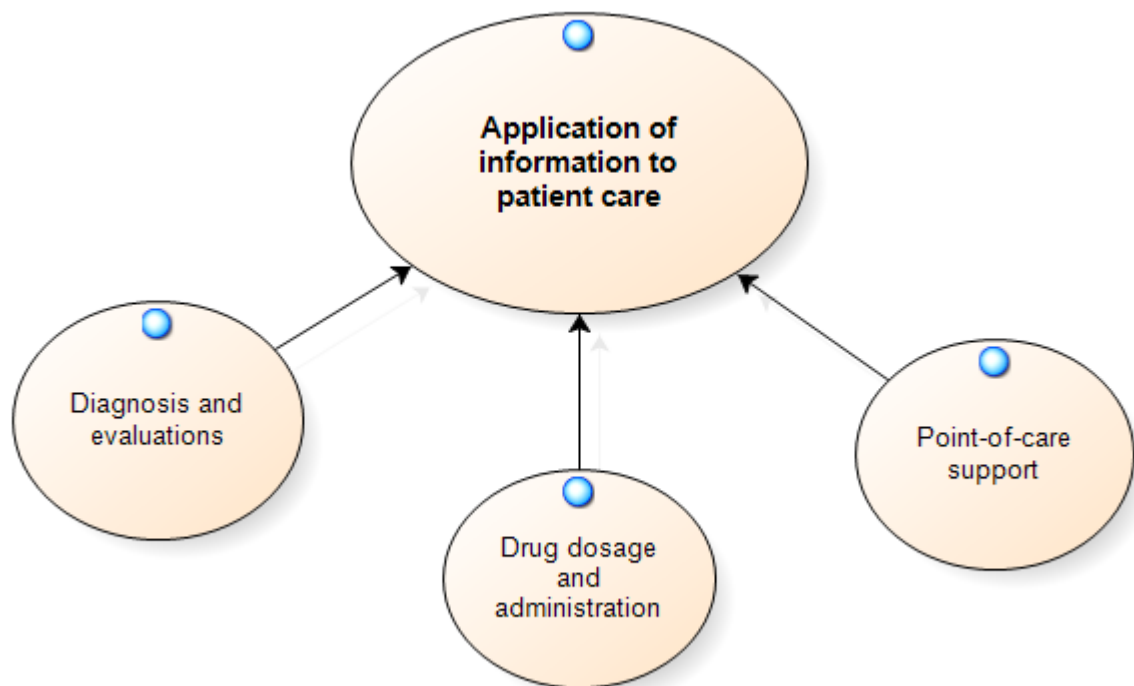
#### 4.7 Theme three: Information Use

Similar to the analysis in the foregoing theme, the analysis done under this theme contributes to providing answers to the second research question for this study:

- In what ways do paediatric physicians in Nigeria engage in information practices towards patient care?

The information practices of the physicians were analysed in this section beginning with their application of information to patient care.

#### 4.7.1 Application of information to patient care



**Figure 30: How the paediatricians applied information for patient care**

There were a number of ways in which the paediatricians applied information to the everyday care of their patients. These areas of practical information use are represented in figure 30 and further discussed in the following sub-categories.

##### 4.7.1.2 Diagnosis and evaluations

There was concurrence among the majority of the paediatricians that access to and use of information was vital to making decisions during the diagnosis of their patient’s illness. Getting the information that was considered necessary for patient care was done in various ways, but the starting point was often the information given by the patients about their illness. As one paediatrician said, “[obtaining] ... information from patients [was necessary] for you to know exactly what is wrong with them” (Interview 2, male, Resident). Another clinician said:

*“[...] if you are going to evaluate a patient you need information from the patient, and then with that information you can do the evaluation and come up with a diagnosis for the patient”* (Interview 10, female, Resident).

The importance of the information the physician gets from patients was stated this way by another clinician; *“It makes diagnosis easier, at least you know the investigations you have to do to narrow your diagnosis [...]”* (Interview 15, female, Consultant).

Basically, information served as the tool for clearing the physician’s doubts about the decisions s/he takes on the patient:

*“[...] but when I discussed with my colleague who was with me right there in the clinic, there were other things we found out. After our discussion I saw some sense in what was suggested and saw reason to deepen the diagnosis”* (Interview 2, male, Resident).

The same physician suggested he could cross-check his diagnosis using another method:

*“[...] maybe your diagnosis was wrong ab initio, you still go back and check the literature for better ways of treating the patient”* (Interview 2, male, Resident).

Other physicians said:

*“There was also a recent one I handled; I am into paediatric nephrology so I had one that presented with kidney failure and I wondered why so sudden; what could be responsible? I had to go back and opened up the internet; I looked at the features the patient presented Vis a Vis the information I got, and that helped me make up my mind on the diagnosis”* (Interview 15, female, Consultant).

*“Right here using my phone I can readily check-up something over the internet, maybe I have a diagnostic dilemma and I’ve looked at the case and cannot really say what exactly it is, I can access the internet to verify the presentation”* (Interview 16, male, Resident).

One of the paediatricians specified some of the implications of an initial wrong diagnosis to the process of caring for a patient:

*“Once a wrong diagnosis is made, it takes extra effort to come back to track. So if the doctor does not get it right initially, even if it was got right later that would be with extra effort because the first doctor that reviewed the case may likely channel other people’s mind towards the wrong direction”* (Interview 9, male, Resident).

A physician’s ability to correctly apply medical information was generally perceived as one of the decisive factors for arriving at the correct decisions during the diagnostic and treatment process.

#### 4.7.1.2 Drug dosage and administration

Administering drugs to patients was one of the areas the physicians pointed out as their responsibilities in the process of caring for their patients. Most of the paediatricians alluded to the uniqueness of paediatric care as the reason why drug dosage and administration in the field was more problematic than others. This uniqueness prompts the necessity for their dependence on information:

*“I need information particularly with regards to drug dosing because in this field, we have this uniqueness on dosage due to age differentials. I will not say it’s a problem, but it is something that has to keep you on your toes all the time. It is very important that you are sure of not only the type of drug you are giving your patient, but the dosage as well as anything otherwise could leave the child with unpleasant consequences. [...] you must be fully aware of any changes in drug formulation that might affect the dosing requirements for each age and weight category”* (Interview 20, female, Resident).

Another related but general factor applicable to other fields which pre-empted the need for drug information among the paediatricians was that:

*“The pharmaceutical companies produce new drugs almost every day and these drugs are to be prescribed by doctors. One wouldn’t prescribe a drug that one does not know about, and sometimes there are modifications on the existing drugs and the formulations”* (Interview 9, male, Resident).

This foregoing clinician also narrated how he handled this problem: *“What I do is first to read the leaflets from the pharmaceutical company and that gives me an idea of what to do in prescribing the drug”*.

The physicians utilised diverse sources for obtaining the information necessary to surmount the challenges they encountered with administering drugs to their unique patients. Some of the paediatricians said:

*“Some of us have drug formulary in our phones [...] we also check it up for drug dosing. [...] you can even look at pharmaceutical books to have a better idea of drugs and their side effects”* (Interview 16, male, Resident).

*“[...] I have my drug formulary stored there [on an iPad] as well, so if I think I need a double check on dosage and administration I don’t hesitate at all in using it”* (Interview 12, female, Registrar).

*“Sometimes you need to clarify some issues maybe dose of drugs, which particular drug to use or which one is available in your environment. We had a patient that was quite ill, a child that had sepsis we placed her on a treatment and needed to get higher. I discussed with my senior colleagues and went online to see that there were higher drugs to be used [...]”* (Interview 11, female, Senior Registrar).

It appeared there was a consensus that this uniqueness in the treatment of paediatric patients required every paediatrician to depend on constant information updates for prescribing and administering drugs to patients. This need was necessary to ensure correctness, and in order to avoid the occurrence of some unpleasant and unintended outcomes for the patients.

#### **4.7.1.3 Point-of-care support**

Accessing medical information sources for evidence at the immediate point of patient care appeared a growing practice among the physicians. Some interviewees explained the reasons behind this development. One of the reasons was that it assisted the physicians when they needed be sure about some details. Discussing on that factor these clinicians said:

*“There are times when you may not be too sure about something. It may even be just a little detail that is not immediately very clear in your mind, not that you don’t have any knowledge of it at all. That’s why I am always consulting with my iPad by my side because it gives me quick information whenever I need to do a check on anything. Most times using it helps you to be sure about the correct procedure to follow especially for rare ailments”* (Interview 12, female, Registrar).

*[...] some patients can present with bizarre presentations; something that is not specific. Even at the bedside, you can google or browse for more information or search to refresh yourself on something you have read before but have forgotten the typical presentation.... You can easily check-up some things and at least make sure you are correct before the prescription of drugs that are not routinely used”*. (Interview 5, Resident, male).

*“We are now grateful that we have the smart phones which enable us to do some browsing though sometimes they may be very slow and you cannot access what you need. Accessing information at the point of care is actually very needful whether during consultation or you are doing the ward round”* (Interview 15, female, Consultant).

However, a few of the clinicians still harbour a preference for relying on the information obtained prior to clinic time during patient care, except when point-of-care information access could not be avoided:

*“I think that if you have the information beforehand, it will be a better way of managing the patient than having it at the point of care [but] if you are dealing with a confusing scenario when the patient’s presentation is not straightforward you’ll want to access information at that point to be sure of what you are dealing with”* (Interview 6, female, Resident).

Those physicians who were already practicing point of care access to medical information and those who considered it as a useful practice, albeit not yet practicing it, outnumber those with the disapproving mind-set.

#### **4.7.2 Benefits and implications of information application for patient care**

This second part of the analysis under the theme of information use examines the physicians' perception about the benefits of applying information during patient care. This was meant to contribute to gaining perspectives on the value the physicians placed on access and use of information for making clinical decisions. The analysis contributes to partly answering research question 3:

- Does the paediatricians' information experience have implications for their information practices and patient care?

With specific focus on implications for patient care, information access and use during patient care was uniformly perceived as not only contributing to the physician's decisions during the process of caring for patients, but also significant in determining whether the desired treatment outcomes were eventually obtained.

The paediatricians' outlined several benefits of information use for patient care during the interviews. Their perceptions underscore awareness that accessing and using medical information to support patient care was important for achieving effectiveness in the process. The several benefits and implications which the physicians attributed to information use in patient care are:

##### **4.7.2.1 Answering patient queries**

Sometimes paediatricians faced very engaging curious questions from some inquisitive patients during the process of providing care for them. These patients require physicians to offer them information such as on the type of sickness, course of its treatment, drugs recommended and the implications for their health in general. In most cases, patients in this category do not come to the hospital devoid of any knowledge about their type of illness. They seem to be interested in obtaining a professional perspective from the physician for assurance. This demand poses a challenge to the physicians who are obliged not to offer any misleading information and must avoid giving the impression that they do not know much about the questions posed to them. One resident described the scenario:

*“The world is a global village they say, so before they come [the patients], most of them arm themselves with information, especially those with a chronic illness that they know they will have to live with. They look it up and they come and ask you questions and you their doctor*

*will have to definitely keep updating yourself so that you can always meet their quest for knowledge*". (Interview 1, Resident, male).

This perspective about the current changes in the dynamics of physician-patient/relatives information exchange landscape was shared by a consultant who said that:

*"[...] now the same patients have access to information so one should be careful on what you tell the patient. In other words you must tell the patient the right thing. You don't bamboozle patients anymore. That's what access to information does. If you go online, the information is there [...]"*. (Interview 19, Consultant, male).

The fact that health information is now easily obtainable from diverse electronic sources via the internet has armed some inquisitive patients with a good degree of knowledge about their health. The corresponding consequence of this for the physicians is that they increasingly face the challenge of ensuring that they stay more and always current in order to adequately answer patient queries. However, the overarching perception among the physicians on this development about doctor-patient information exchanges as expressed by this clinician is that; *'...the patients should have information about their condition, whatever the diagnosis is'*<sup>11</sup>. This presupposes that every doctor should be adequately prepared with the right information to satisfy inquiring patients and/or their relatives in those situations.

#### **4.7.2.2 Assistance in making clinical decisions**

While discussing about what he did when he was faced with a particular critical incident a consultant said that his team had *'to look for credible information to support [their] decisions'*<sup>12</sup>. Obtaining the right information was generally perceived as critical for the physicians in making the correct diagnostic, drug prescription, treatment and recovery management decisions about their patients.

The *'first line of information'* a physician needs for making his or her decision is obtaining history from patients in order *'to know exactly what is wrong with them'*<sup>13</sup>. In more critical cases, laboratory investigations are conducted to support or supplement diagnostic evaluations and to provide the evidence for making initial or further treatment decisions. A clinician described the information obtained in support of a particular case as *'very significant in helping take a decision on the patient'*<sup>14</sup>. This view echoes that of many others who discussed

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<sup>11</sup> Interview 4

<sup>12</sup> Interview 14

<sup>13</sup> Interview 2

<sup>14</sup> Interview 6



the centrality of a physician’s access and use of the right information as necessary for assisting clinicians to make correct patient care decisions.

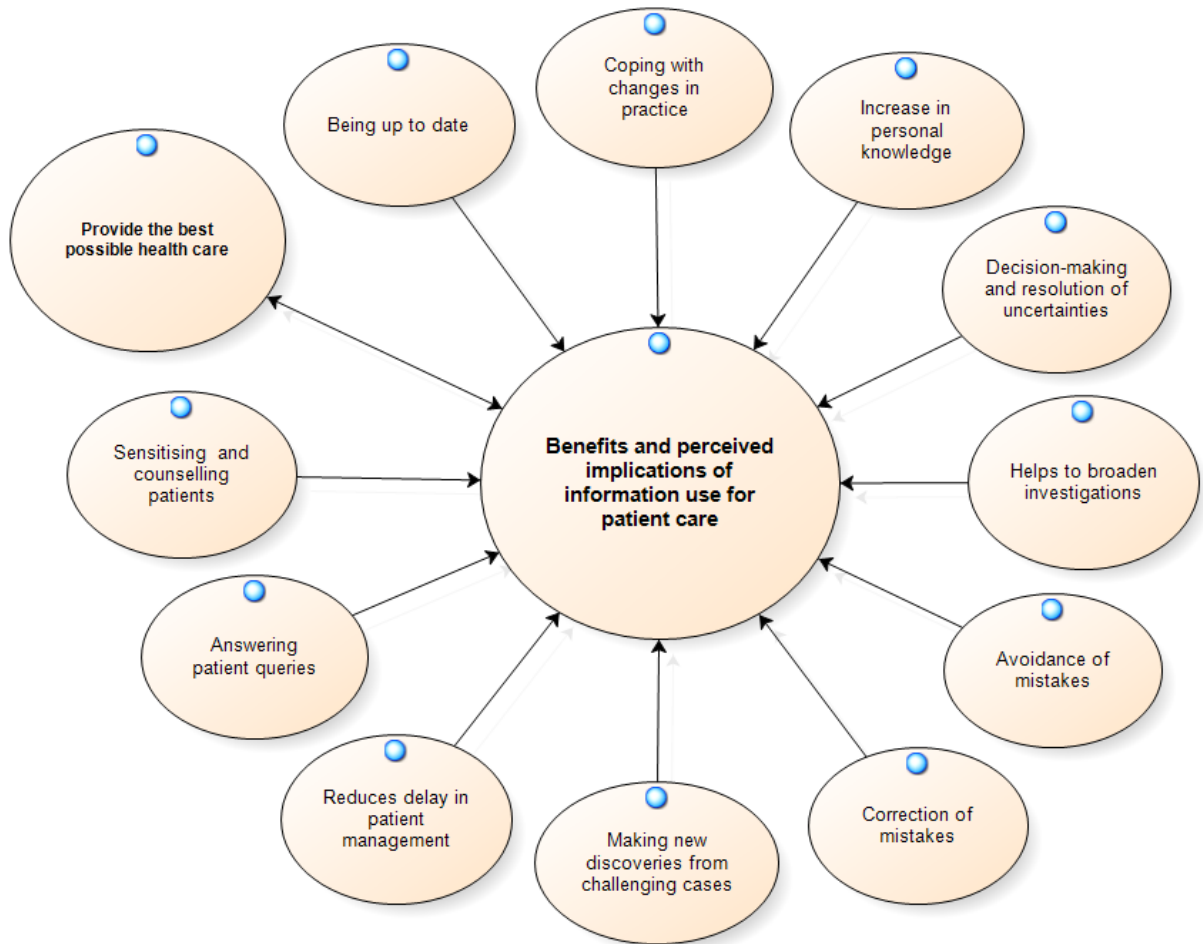


Figure 31: The paediatricians’ perception of the benefits and implications of information use for patient care

#### 4.7.2.3 Avoidance of mistakes or clinical errors

Two very important steps were identified by a resident as critical to the patient care process. According to him the *‘most important thing is to get your diagnosis right’* and secondly to *‘take the right procedure’*<sup>15</sup>. Obtaining the right information was perceived as central to achieving these important preliminary steps.

The importance of supporting the physician’s decisions with information in order to avoid mistakes was underscored by the confession of a registrar that *‘there are times when you may*

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<sup>15</sup> Interview 1

*not be too sure about something*<sup>16</sup>. This heightens the imperative of another clinician's counsel that *'...it is always good to be sure because life is what is involved and mistakes could be fatal in the end'*<sup>17</sup>.

A physician's avoidance of mistake was perceived as very necessary in the patient care process because:

*"Once a wrong diagnosis is made, it takes extra effort to come back to track. So if the doctor does not get it right initially, even if it was got right later that would be with extra effort because the first doctor that reviewed the case may likely channel other people's mind towards the wrong direction"*. (Interview 9, Resident, male).

Applying the right information was generally perceived as useful for avoiding errors that could either take precious clinical time and effort to correct, or more severely, lead to other unwanted outcomes such as the death of a patient.

#### **4.7.2.4 Being up to date**

The impression of one clinician that *'colleagues that are not attending conferences and generally updating themselves with new knowledge might be a bit outdated'*<sup>18</sup>, reveals the perceived contribution of information to keeping the physicians up to date with current practices in patient care. Discussing about her information needs, this same clinician said that it was *'...to know what the current trends are, what other people in other places are doing, where the world is going to now as you cannot just stay with the old practice'*. Similar views were expressed by many others about keeping up to date with current trends through constant receipt of information.

Majority of interviewees affirmed that attendance to conferences provide the opportunity for obtaining up to date information from other colleagues which enables them keep abreast with the current trends. Journals, current books and electronic medical sources were also generally perceived as the sources useful for obtaining current information about patient care.

#### **4.7.2.5 Coping with changes in practice**

Obtaining the correct and useful information was perceived critical for a paediatrician's ability to cope with the constant procedural changes for managing childhood illnesses. One

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<sup>16</sup> Interview 12

<sup>17</sup> Interview 17

<sup>18</sup> Interview 11

clinician commented that in paediatrics *'things come up every day, new ways of doing things'*<sup>19</sup>, echoing the perspective of another clinician that procedural changes occur more frequently in paediatric health care. This clinician said; *'[...] we experience more procedural changes in the field of paediatrics than in other specialties [...]*'<sup>20</sup>

The frequency of changes in procedure was explained by some clinicians. A Consultant said that *'...there are changes both in causes of disease and the interventions'*<sup>21</sup> while a Resident confirmed that *'old things [procedures] are being reformed and new methods are being discovered'* in his further view, *'on a daily basis'*<sup>22</sup>.

The methods people were taught in the medical school were also affected by these constant changes. As someone said; *'the way it was when we trained is not the way it is today. Things keep changing especially when it comes to tropical illnesses...'*<sup>23</sup> Acquiring the right information to cope with this state of constant procedural changes was perceived as very important to the physician due to its imperative for enabling the delivery of effective patient care.

#### **4.7.2.6 Correction of mistakes**

Information was perceived as useful for correcting errors made by the physicians, for example, having to change the procedure of treatment mid-course, when the desired results were not obtained in a case owing to the wrong clinical decisions. A Resident doctor explained that a physician's realization of mistakes when managing a patient leads to re-assessing the entire course taken. He said that:

*"[...] at the point of managing a patient and you find out that what you have done is not giving the expected result, maybe your diagnosis was wrong ab initio, you still go back and check the literature for better ways of treating the patient"*. (Interview 2, Resident, male).

*'Check[ing] the literature'* as this physician mentioned, was done to obtain the information on *'better ways of treating the patient'*. Ultimately, the physician learns from this process and becomes more equipped with the knowledge of how not to repeat the errors of previous cases. This was the main objective of death reviews, when eventually death cases were encountered. A consultant described what usually happens during the death reviews:

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<sup>19</sup> Interview 4

<sup>20</sup> Interview 20

<sup>21</sup> Interview 15

<sup>22</sup> Interview 9

<sup>23</sup> Interview 1

*“Besides, if we have a death case, it is also summarised and presented on Friday mornings. It takes about an hour. The team that managed the case will present it for the house to dissect to find out what best they could have done and what would be done if such a case comes again”.* (Interview 19, Consultant, male).

The death reviews provide a means through which the physicians obtain knowledge useful for managing similar cases better in future. This knowledge is obtained through information sharing. Specifically in that process, the consultants play a lead role by sharing their wealth of experience and knowledge with the junior doctors, on the most effective ways of avoiding the mistakes (if any) leading up to the death of a patient.

#### **4.7.2.7 Helps to broaden investigations**

In some instances the re-assessment of a patient’s case may necessitate the broadening of the investigations previously conducted. Where undertaking this routine becomes necessary, obtaining oral information from patients, often through re-taking the history and discussions with colleagues facilitates the process.

Discussing with a colleague could afford physicians information about ‘*a variety of alternatives on what to do for the patient*’ as well as ‘*the different consequences of each action*’<sup>24</sup> to be taken. A Resident described what happened in a patient’s case after he held a discussion with a colleague; ‘*After our discussion, I saw some sense in what was suggested and saw reason to deepen the diagnosis [...]*’. As this physician further said; ‘*That [the discussion] helped us to broaden our investigation*’<sup>25</sup>. Eventually, this physician was able to arrive at the actual problem of the child through the broadened investigation.

#### **4.7.2.8 Increase in personal knowledge**

There was a unanimous perception among the physicians that individual information experiences, often gathered by people in various ways, influenced their personal knowledge about patient care. The knowledge people obtain from those experiences could be about various patient care issues such as on drugs, diagnosis and treatment. Obtaining such knowledge could happen at any point in patient care, including at the point of care, as described by this clinician:

*“[...] at the point of care when you are treating a patient, there’s a point you get to that you really need to refer to somewhere to get information on how to continue from where you*

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<sup>24</sup> Interview 12

<sup>25</sup> Interview 2

*stopped. You can call your senior colleagues, senior registrars and consultants. These people have experience and are better informed [...]*". (Interview 13, Resident, female).

It appears that of the different ways people could obtain information to increase their personal knowledge about patient care, one of such methods has a unique quality in its impact on the paediatricians. A clinician explained that because what he learnt sometime about how to manage a case was 'on the spot' it 'will be difficult for [him] to forget again'<sup>26</sup>. This comment highlights the mnemonic impact and value of increasing personal knowledge by learning through practice.

#### **4.7.2.9 Making new discoveries from challenging cases**

Many physicians agreed there were situations when they had no knowledge of the next action to take about a patient. One clinician said that '*there are some cases you see and you've done everything you should do for this child and the child is still not out of the woods... but I wasn't sure what I was dealing with....*'<sup>27</sup> Another clinician explained that what happens in such situations is that '*[people] go back home and do more research and find out that there is something else [they] could have done that could have changed the whole picture*'<sup>28</sup>.

One clinician described what happened when she encountered a particular critical incident and said:

*"The child had a problem and I wasn't sure what it was, but it was a vaginal bleeding. From the information we gathered we understood that the case was a urethral prolapse and that the child can get more help with a referral to a Gynaecologist"*. (Interview 6, Resident, female).

Another clinician described what his team did about a critical incident which led to a new discovery:

*"We had to look up literature especially on researches that have been done on this ailment and found out that it is not commonly seen in children [...]"*. (Interview 1, Resident, male).

These challenging patient care incidents often provided a means for the physicians to learn from practice and to make personal discoveries about how best to handle such cases.

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<sup>26</sup> Interview 7

<sup>27</sup> Interview 4

<sup>28</sup> Interview 2

#### 4.7.2.10 Reduces delay in patient management

Some clinicians suggested that information which a physician possesses either tacitly or accessed from explicit sources contributes to the reduction of time taken to treat their patients. Discussing on the time-saving contribution made by accessing medical information online during patient care, this clinician said:

*“[...] with the improvement in technology now you check it [the medical information] there and there will be no delay in the management because there are some stages of delay in patient treatment, so at least you remove some delay in the sense that something you will go back to check, you may check it there at the patient’s bedside”.* (Interview 5, Resident, female)

This contribution of information to saving treatment time was corroborated by another clinician who said that *‘what you [referring to a physician] know will affect the time you take to treat patients’*<sup>29</sup>. This same clinician further noted that *‘one major contribution of information is quick intervention, in the management of illnesses.*

#### 4.7.2.11 Sensitising and counselling patients

Some physicians perceived their routine responsibility to patients extend beyond illness treatment-only health care. One of the services the physicians felt they were obliged to render during patient care or in community medicine was to sensitise or counsel people about their health.

According to one of the clinicians; *‘...when you are talking about treatment it involves all aspects including psychological treatment, drugs, counselling, change of behaviour, lifestyle changes [...]’*<sup>30</sup>. Because of the demands of this responsibility, the same clinician viewed that in *‘public health [the physician would] need information on the people and on how to disseminate information to them’*. Furthermore, he said that the effect of possessing such information resulted in the physician being able to *‘talk more confidently to the parents if [they] have correct information’*. This was exemplified by the fact that a consultant whose team initially lacked knowledge of how to handle a rare case later admitted that based on the information they got they were not only able to successfully treat the child, but also able to counsel the child’s parents on how to handle the child’s recovery. He said; *“We were able to manage that child based on what we discovered and*

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<sup>29</sup> Interview 18

<sup>30</sup> Interview 19

*also gave the parents counsel on the post-treatment care for the child*". (Interview 14, male, Consultant). [The researcher's emphasis]

#### **4.7.2.12 Provide the best possible health care**

There tended to be a common awareness and agreement among the physicians that the chances of taking the best possible decision during patient care was to a large extent influenced not only by the application of tacit knowledge, but also by access and use of medical information correctly.

The unanimous view was that the physician's ability to correctly combine explicit knowledge accessed from external sources with tacit knowledge, while engaged in patient care, is a primary requirement for achieving best possible care. This pervasive perspective appears summarised in one clinician's view that *'the ultimate goal in patient management is patient satisfaction and good outcome'*, and to achieve this objective he further said; *'you have to keep updating yourself in order to give the best to your patients'*<sup>31</sup>.

Ideally, it requires constant access and assimilation of new medical information for a physician to keep up to date with current patient management methods. The personal effect of achieving this objective was described by this clinician who informed that; *'Keeping up to date gives me the assurance that I am taking the best decision and that I am giving my patients the best'*<sup>32</sup>. Put differently, this clinician admitted he would be constantly exposed to a lack of assurance about clinical decisions on his patients, if he lacked the appropriate and up to date knowledge, which could potentially impact the provision of best possible care negatively.

### **4.8 Theme four: Information seeking behaviour**

The debate about what factors influence people's choices in information seeking within their information environment appears rife in the literature. However, despite the heterogeneity of views on the topic, there seems to be some level of agreement that the methods people adopt in seeking information is dependent on various factors that converge around, cohere with and feed into their information needs.

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<sup>31</sup> Interview 1

<sup>32</sup> Interview 17

The methods used by the paediatric physicians for building their information capacity and consequently their knowledge from the use of the information sources in this regard is analysed in six sub-themes under figure 32.

#### 4.8.1 Methods used for information capacity and knowledge building

The analysis done under this category of theme four contributes to answering research question 2:

- In what ways do paediatric physicians in Nigeria engage in information practices towards patient care?

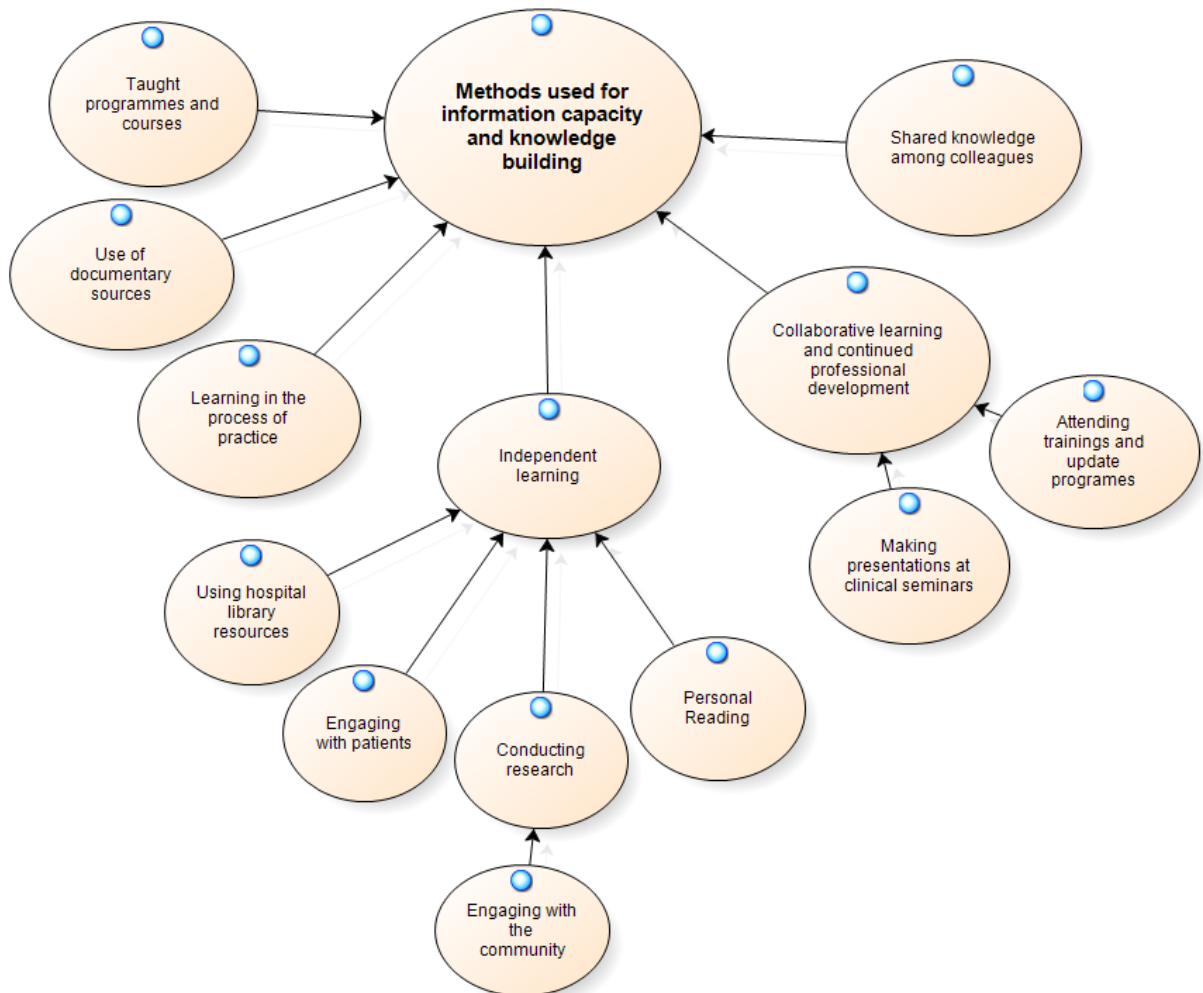


Figure 32: Methods used by the paediatricians for information capacity (literacy) and knowledge building

#### Taught programmes and courses

Interviewees were almost unanimous in their views that courses which were designed specifically for teaching information competence were rare during their respective periods of



learning at the medical schools. They also faced similar limitations collectively in their post-qualification practice.

However, it appeared that some of the courses taught pre-qualification and post qualification to the paediatricians, even though less detailed on specific information skills, provided avenues for learning the importance of information application to patient care. The taught programmes and courses that took place while the physicians' were already qualified were either part of the activities within the hospital or externally organised events, such as workshops and conferences.

Except for a few cases, most of the courses offered were not focused on providing skills that directly honed people's individual information capabilities, as it was revealed, "*most of the things we did were basically clinical things right from the start*" (Interview 1, Male, and Resident). The courses taught at the medical schools were generally tailored toward providing only the medical knowledge required for discharging patient care, but not the skills required for information search to support such care.

Two of the interviewees seemed to have had a rare difference from the general experience of other physicians during medical school training on information skills development. They said:

*"[...] during my medical school training there were terms when our courses included some computer training and how to use the internet. I think that was geared towards making us understand that there's a wider information base over the Net that we can access and use to better our knowledge and practice"* (Interview 16, male, Resident).

*"[...] in the medical school where I trained in Enugu at the UNTH, there was this mandatory IT training done in conjunction with Afrihub where they give you various strategies on how to access information, use the internet and the do the basic information search things"* (Interview 2, male, Resident).

Some rare opportunities during post-qualification provided direct teaching of information skills to the physicians. As one interviewee revealed:

*"During residency I attended conferences and seminars where we were taught how to do research and how to conduct information searches. We were taught research methodology and how to use the internet for information search. We were introduced to the use of PubMed for obtaining medical information [...]"* (Interview 11, female, Senior Registrar).

Similarly another clinician said:

*“[...] I remember the last conference I attended [...] one of the slots was about how to search for information [...]”* (Interview 15, female, Consultant).

Besides these few cases of conscious information skills teaching, the majority of physicians complained of having experienced a general inadequacy of information skills training at their respective medical schools during professional education.

### **Use of documentary sources**

Reliance on documentary sources such as books and the internet for solving information needs and improvement on knowledge was a general practice among the physicians.

Some interviewee comments revealed the most recurrent information activities:

*“I go to my textbooks first, and then I go to the internet. I go to the most important textbook – Nelson, then I support it with other textbooks and then I go to the internet. But if I am not close to my textbooks because I don’t carry them all the time, I go to the internet first”.* (Interview 3, Resident, male).

*I check for information in my book and if I can’t see it in my book I go online to check it in the internet* (Interview 12, Registrar, female).

*“I make use of textbooks. There are standard textbooks that we use; a lot of them. You see when you walked in here I was reading. I read my books... I make use of the internet every day and my textbooks”.* (Interview 2, Resident, male).

Ready availability was ascribed as the reason why these sources were used; *‘I first start with what is readily available which may include my textbooks’* (Interview 6, Resident Female).

### **Learning in the process of practice**

Several learning experiences were suggested in interview comments as accompanying the physician’s continued engagement with the process of patient care. One of such experiences associated with practice was an awareness of the appropriate sources of medical information to meet an information need. In one physician’s view: *“You must be aware of the source where the particular information you need for something is, and I think it’s something you develop as you keep practicing”.*

Perhaps the opportunity afforded by this means of learning and self-improvement explains why one resident physician affirmed confidently that:

*“As I am now, I believe that before I leave here today I would have become a better person than I was through the information I will receive [...]”.* (Interview 2, Resident, male).

From the enthusiasm of this resident physician, it was obvious that the opportunity to learn in this way infuses people with the satisfactory feeling of belonging to a community of practice that works as a group to develop each other's capabilities. The resident further explained "[...] *so we work together as a group, everybody is just striving learn. Even the consultants get extra motivation, extra challenges. Some of them might ask you to look something up and report to them next day. So from that you know your deficiencies and they correct you.*"

It appeared that learning through practice presented the paediatric physicians with a slightly different type of experience from the conventional classroom type of learning. The type of experience associated with this iterative process of learning through practice was described by one interviewee:

*"This profession is about skill acquisition. You do it the first time and you might not get it rightly, you do it again and your knowledge of the process improves. Now when you do it repeatedly it becomes part of you. That initial stage is when you will need to consult information sources more for guidance and as you repeat the procedures your knowledge and ability to handle it broadens"* (Interview 10, Resident, female).

The significant point made by this description is the occurrence of a progressive increase in the physician's confidence, competence and proficiency ascribed to knowledge building in practice.

### **Independent Learning**

It was evident in the comments from many physicians that a very significant contributor to people's information experiences and practices was their willingness to engage in independent learning. People learnt independently through conducting research, personal reading, and engaging with their patients.

When many interviewed physicians echoed in different ways a comment such as; *it was just what I learnt from people and from personal effort*<sup>33</sup>, what was generally the underlying disapproval was the scarce opportunities available to them for formal information literacy training. The recourse to various forms of self-learning which perhaps bolstered their individual information experiences was firstly, a result of this vacuum in their learning experiences, and secondly, it was forced in most cases.

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<sup>33</sup> Interview 10

## **Collaborative learning and continued professional development**

Learning by mutual co-operation among the physicians appeared a popular practice that provided people opportunity for building their knowledge. The physicians within the paediatric department were normally grouped to work in teams and different units on the clinic days assigned to each team or unit. However, in order to foster learning opportunities, the physicians collaborated to share knowledge across their different groups. These opportunities were by way of mutual arrangements or through the weekly clinical conferences that compulsorily brought all the teams and units together for information sharing.

The collaboration that takes place mutually when challenges with patient care arose was described by this interviewee: “[...] *people went home and checked up textbooks and the Web, came back and discussed and arrived on something*”. (Interview 5, Resident, Male). Using a particular incident to explain the merit of this collaborative way of learning, this interviewee said:

*“What helped the process was the availability of the sources to consult and the fact that different ideas were collated. The group effort helped the process because it offered us the opportunity to make comparisons and take the best possible route”*. (Interview 17, Resident, male).

Another form of collaborative learning was when people belonged to learning societies or associations to improve their knowledge. Some of these learning groups were formed at the medical schools, while others existed within the community of practice of the already qualified physicians at the hospital. One interviewee described his own involvement:

*“I was in an Association in school called Medical, Research and Maternal Society where we had lectures and seminars on information skills [...]”*. (Interview 8, Resident Male).

Already qualified and practicing physicians participate in the activities of different learning associations to build on their knowledge as described by a Consultant:

*“The medical association here organises what we call continuing medical education and doctors are expected to participate so they could get information on current issues in managing patients”* (Interview 19, Consultant, male).

Discussing about the various information activities paediatricians in that hospital engaged in, another clinician said; *‘we also attend external paediatric seminars around the country’*<sup>34</sup>.

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<sup>34</sup> Interview 3

These associations provided the physicians with the opportunity for collaborative learning, networking and a continuous platform for knowledge building. The forums also provided the clinicians with the opportunity to closely interact with colleagues from other hospitals to exchange ideas and share information. Many clinicians perceived the information received at these meetings as useful to their work-roles.

### **Shared knowledge among colleagues**

Similar to collaborative learning, where purposeful cooperative arrangements for information sharing and knowledge building existed among the physicians, was the practice of sharing knowledge at the interpersonal level. By putting calls across to colleagues or face-to-face discussions, people mutually shared knowledge that facilitated personal decisions during patient care.

Choices made about initial contacts are usually determined by individual preferences or levels of experience as shown by these comments:

*“[...] the first thing I do is to call my colleagues. The information they give usually helps me [...]”*. (Interview 10, Resident, female).

*“I am a Resident doctor, the consultant owns the patient and even if he’s not there, I can put a call across to him and he will come and review with me. If he’s not on duty at that point, we’ll discuss on phone”*. (Interview 2, Resident, male).

*“[...] when you feel there is need for clarification, the first person to contact is your senior on call. For example, I am a registrar and if such need arises for me I call my senior registrar and when we cannot solve the problem, we call our consultant”*. (Interview 12, Registrar, female).

*“[...] I can call another colleague elsewhere or some other doctors outside the paediatric field if I feel they could have the knowledge of what will help. Sometimes I call on a pathologist and sometimes I call on an urologist, so it depends on the case. I had this difficult case sometime in the past in the new born unit and I had to ask the matron if she had an idea of what to do in that case and her suggestion helped[...]”*(Interview 14, Consultant, male).

Some physicians attributed various merits to discussing with colleagues. A clinician revealed through this comment that; *‘last year someone taught [him] how to use Google scholar’*<sup>35</sup>, in which case that aspect of knowledge was unclear to him until he discussed with a colleague. Comments such as; *‘you might have a different dimension and you get a different view of that*

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<sup>35</sup> Interview 8

case' and 'when I discussed with my colleague...there were other things we found out'<sup>36</sup> exemplify the physicians' belief that this practice had advantages for the improvement of knowledge.

In the same vein, similar comments suggested that during the discussion process people 'pick up useful information'<sup>37</sup> and 'understand better...confusing presentations in a disease condition'<sup>38</sup>. In the aftermath of attendance to conferences, people were inclined to sharing their experiences to the benefit of enhancing other people's knowledge. A clinician reported that: "...when colleagues attend these conferences, they share their experiences with others and that keeps everyone abreast of current happenings particularly new ways of managing particular sicknesses"<sup>39</sup>. An example of this practice was described by this comment:

*[...] some might not have gone for neo-natal resuscitation for years, but when a few attended the recent conference at Abakaliki on neo-natal resuscitation, they came back and updated others [...]*". (Interview 3, Resident, male).

A Consultant described the contribution made by the community of practice toward facilitating this method of learning during clinical seminar presentations:

*"[...] a lot goes on in a typical day when we do ward rounds. So what happens is that the resident that took the call documents everything and will do a formal presentation where we take a critical look at what was done. We look at everything; the way you presented your history, your confidence and choice of words [...]"*. (Interview 19, Consultant, male).

This type of learning under the close supervision of superiors was also replicated at a wider scope in groups where paediatricians were assessed in units. This Consultant further said:

*"[...] on Wednesday afternoon we do a clinical conference. What it entails is that the units pick up a case in their unit, read around it, summarise issues and present it to the whole house. The team is taken up on how they managed the case for them to defend what they did for that child. If there's anything the team did not do right, we point it out, because it happens. It is a learning process [...]"*.

At some points, some of these discussions bring up startling self-reflection for the physician; '...sometimes you will discover that the things you thought you know that someone can explain it better and that helps you gain more insight'<sup>40</sup>. In this way, discussions with colleagues serve as a gateway for the physicians to learn from potentially useful information

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<sup>36</sup> Interview 2

<sup>37</sup> Interview 1

<sup>38</sup> Interview 10

<sup>39</sup> Interview 9

<sup>40</sup> Interview 16

held tacitly by their colleagues and explicit knowledge obtained through team research and presentations.

#### 4.8.2 Forms of information accessed by the physicians

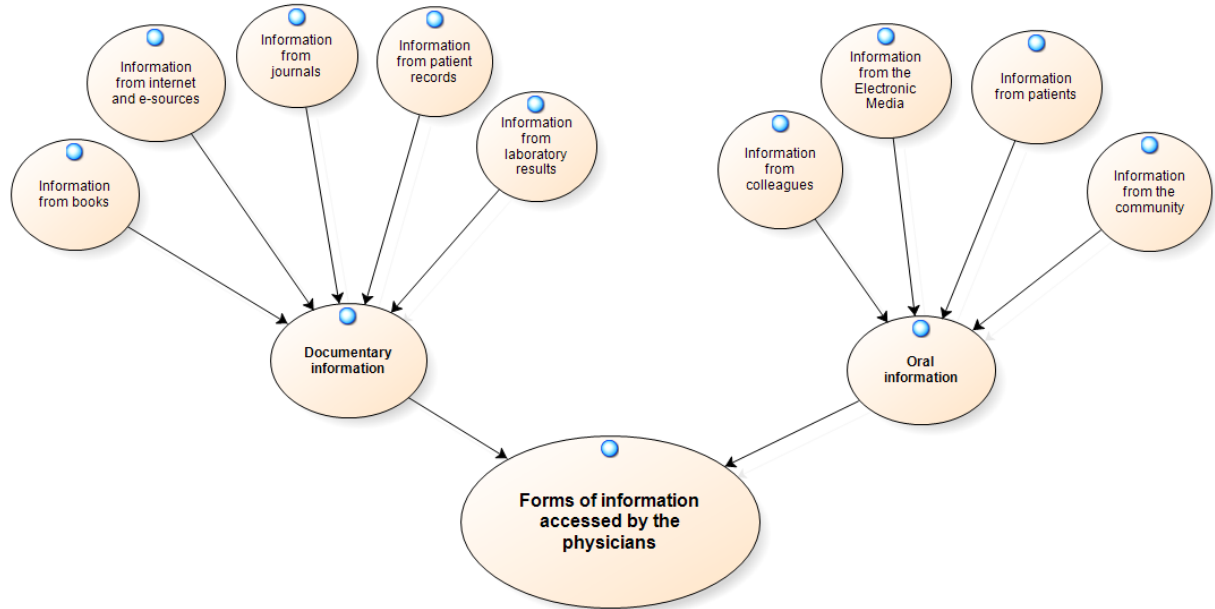


Figure 33: Forms of information accessed by the paediatric physicians

The paediatricians utilised a combination of two major sources of information – documentary and oral sources – for obtaining information relevant to their work role and personal development. The interview data identified five and four distinct types of sources for documentary and oral formats respectively as shown in figure 33.

##### 4.5.2.2.1 Documentary Information

The five different types of sources under documentary information were identified in the interview data as those the physicians utilised for information needs; journals, laboratory results, patient records, books, the internet and other e-sources. These information needs were generally orchestrated by the need to facilitate decisions during patient care and to contribute to the professional development of the individual physicians.

##### Books

Medical textbooks, particularly those in print format, were discovered to be the most popular and most frequently utilised source of documentary evidence among the physicians. The reasons for the popularity of books were many and varied.

Some of the reasons why books appeared popular and more frequently utilised than other sources were that in some of the physicians opinion, books easily provide ‘*a basic pathological understanding*’ of a case being handled, and are also very useful because one could ‘*actually make jottings*’<sup>41</sup> in them in the process of reading. This factor contributed to why people preferred hard copies of books to the soft formats. Another clinician believed that ‘*textbooks are reliable*’ in terms of their information content, and would therefore, ‘*go for the standard textbooks first*’<sup>42</sup> whenever there is information need.

The popularity of one of the ‘*standard textbooks*’ as the most preferred source of information was so widespread that almost every physician owned a personal copy of it, and it was given a nickname to underscore people’s perception of its informative value and authoritativeness:

*[...] we’ve termed the Nelson book of paediatrics **the bible of paediatrics**, so most times whatever you want to do in terms of information, you start from there*”. [Emphasis inserted by researcher] (Interview 6, Resident Female).

### **Internet and other e-sources**

The use of documentary evidence from the internet and other electronic sources appear to be increasing in popularity among the physicians. This perception was echoed by one clinician who said: ‘*basically everybody is on the internet, whether on your phone, on your tablet or your laptop*’. This comment reveals that the paediatricians engaged in self-provision of internet access with their personal devices in order to access medical online information in the process of patient care.

Circumstances that made the clinicians use documentary evidence from the internet were explained by some as ‘*understand[ing] how ...cases have been treated elsewhere*’<sup>43</sup>; ‘*when [they] needed to compare*’; ‘*for a wider scope and to get a lot of ideas from different authors*’. Due to this fact, this clinician noted that when they engaged in research, [their] ‘*literature search was...basically from the internet*’<sup>44</sup>.

While preparing for an interview, the researcher observed one clinician browsing with a smart phone during patient evaluation. Later on in the interview, while answering a question on

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<sup>41</sup> Interview 1

<sup>42</sup> Interview 5

<sup>43</sup> Interview 4

<sup>44</sup> Interview 1



internet availability and access, this clinician said: ‘...*right here using my phone I can readily check-up something over the internet*’<sup>45</sup>.

Two levels of proficiency appeared to exist among the clinicians on the access and use of documentary evidence from the internet. There were those who could quite ably use it and those who were still newly learning to use it. One clinician said confidently: ‘*I think I am very good in using the internet*’<sup>46</sup>. Another clinician said:

“[...] *I can go a step further to check on specific sites on the internet; not everywhere, like e-Medicine that’s Medscape, I check Wikipedia also but I don’t take it for treatment, I check through PubMed [...]*”.(Interview 11. Female. Senior Registrar).

One of those clinicians in the ‘still learning’ group pointed to a personal need ‘*to know more of where and where not to go for information*’ in an internet search because ‘*the general search you do on the Net throws up a lot of thrash sometimes and leave you with a problem of choice*’<sup>47</sup>.

The use of documentary evidence from the internet to support decisions during patient care is becoming increasingly entrenched practice among the physicians, the dichotomy in their levels of proficiency and versatility notwithstanding.

## **Journals**

Unlike the use of books, the use of documentary evidence from journals to support practice was not as frequent among the physicians. However, it was one source of documentary evidence for the physicians which had an additional impetus behind its use. The reason for this was that journals served two purposes.

One of the purposes served by journals was that it provided a platform for the clinicians to publish and share their research findings with others as one of the requirements for those engaged in post-graduate studies. Discussing what his team did with a particular discovery made in one of their researches one clinician said that they ‘...*had to report it in one of the journals because it’s not something you see commonly*’<sup>48</sup>.

A few of the clinicians confirmed during the interviews that they use journals as source of their medical evidence. Some of those who use journals made the following comments:

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<sup>45</sup> Interview 16

<sup>46</sup> Interview 10

<sup>47</sup> Interview 20

<sup>48</sup> Interview 1

*“[...] I use the internet to search for current researches, I read medical books and journals and sometimes other doctor’s reports [...]”*. (Interview 18, female, Resident).

*“I subscribe to online journals from the American Academy of Paediatrics. That is my preferred choice. I also use a British journal called Archives of Diseases in Childhood”*. (Interview 19, Consultant, male).

*“[...] so I had to go back to source for information on what exactly it is and how best to help this patient. So I searched my textbooks, journals and the internet”*. (Interview 6, Resident Female).

One clinician’s comment echoed an important and perhaps most general reason why people used it as a source of information; *‘I read these journals to keep myself up to date’*<sup>49</sup>. This perspective was perhaps undergirded by a widely held notion in many fields, that journals contain reports of current research offering useful new knowledge.

### **Patient Records**

Patients’ records provide the clinicians with another source of documentary information with which they take decisions about managing their patients. One clinician said: *‘You know the folders carry the information. You need to gain quick access to people’s folders to know their case history [...]’*<sup>50</sup>. This same clinician described a case of managing one patient whose symptoms were atypical to the presentation and how information from the patient’s record aided to clear his confusion:

*“When I came I reviewed the case and felt that it could be possible, but that the whole symptoms did not tie up with that. I looked at the folder [...]”*.

Discussing in the same vein about the usefulness of folders in providing information for the physician, another clinician said:

*“[...] to source for medical information in support of what I do as a doctor, I use the internet ... read medical books and journals and sometimes other doctor’s reports”*. (Interview 18, female, Resident).

The routine recourse to consultation of patients’ records during patient care appeared to contribute to physicians’ decisions. However, the physicians’ comments tend to suggest that the practice was driven more by commonplace requirements, than the search for information to support decisions.

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<sup>49</sup> Interview 10

<sup>50</sup> Interview 8

## Laboratory Results

A clinician suggested that documentary information from laboratory results contribute to a physician's decisions because it helps 'to rule out or to rule in'<sup>51</sup> causes that could be contributory to a patient's illness. Using one incidence to buttress how laboratory results were significant in contributing to a clinical decision, this physician described how in their diagnosis, they had concluded on the causes of the patient's illness but later were proved wrong. He said: '*[...] all we thought about were proved wrong by both our own clinical and laboratory findings [...]*'".

A clinician in the community medicine team also described how laboratory evidence contributed to their decisions during a suspected case of polio outbreak. She said:

*[...] we got information and moved into the community over a suspected case of polio on a child. We needed some form of laboratory investigation with the child's blood sample. We ... did the tests and fortunately, the child was suffering from another disease condition.*  
(Interview 18, female, Resident).

Laboratory results were generally regarded by the physicians as primary documented information useful for making decisions during patient care.

### 4.5.2.2.2 Oral Information

The use of oral sources of information was preponderant among the paediatricians. Various comments revealed how vastly they utilised oral sources of information for meeting their information needs. The oral sources which the physicians utilised include information from; colleagues, patients, the electronic media, and the community. The extent to which they accessed information using these sources varied distinctly. It appeared from majority of the comments, that the most pervasively utilised oral source was information from the physicians' colleagues.

#### Information from colleagues

Oral information sharing and information gathering was the most pervasive information practice among the physicians. Every interviewed physician mentioned this means as a one which they used to get information when in need.

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<sup>51</sup> Interview 2

The different methods the physicians used to get oral information from their colleagues include: *'asking questions'*; and *'calling someone [on phone] when they have a challenge'*<sup>52</sup>. They also engage in holding ad hoc and planned face to face discussions at interpersonal and group levels.

The steps individual physicians took to obtain oral information differed. While some clinicians would first inquire from their mates like these physicians who said; *'the first thing I do is to call my colleagues'*<sup>53</sup>, and *'...I have my colleagues around me. That's the first point of call'*<sup>54</sup>, others, who were in the majority, would prefer to immediately discuss the need with senior colleagues. The step consultants took reflected the uniqueness of their position as the most senior physicians. They could use their influence on the junior physicians to convoke an ad hoc discussion or contact fellow consultants. A consultant said; *'first, I call my team together and we brainstorm or I contact my co-consultants'*<sup>55</sup>.

People also obtained oral information by discussing in groups. During the several visits to the hospital for data collection, the researcher observed that the resident doctors, who were preparing for an external examination, divided themselves into two study groups that met at 4.00pm each day within the hospital premises. The purpose of their daily meetings was to hold discussions in preparation for that examination.

One clinician revealed that the practice of using discussion groups to obtain information was one some people started during their university training in the medical schools. This interviewee said: *'...in the university we formed discussion groups...'*<sup>56</sup> and this perhaps explains why this information practice continued to be vastly utilised within the paediatricians' community of practice.

The clinical meetings and conferences was another means through which the physicians obtained information orally from colleagues. As one interviewee said; *'Every morning we have discussions. We discuss emergency cases and examine whether the right steps were taken'*<sup>57</sup>. One clinician explained that such discussions were useful for harmonising divergent views held by the physicians. She said: *'by the time you come out for discussions the*

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<sup>52</sup> Interview 2

<sup>53</sup> Interview 10

<sup>54</sup> Interview 2

<sup>55</sup> Interview 14

<sup>56</sup> Interview 8

<sup>57</sup> Interview 9

*information tallies*<sup>58</sup>. The researcher observed during his visits to the hospital, that these meetings were usually held in the paediatric department conference room between 8.00 am and 10.00 am each day, before the doctors begin consulting out-patients.

People also obtained information orally when they attended conferences, workshops and seminars organised by their professional bodies either within or outside the hospital.

### **Information from radio and television**

Radio and television provided another means through which some of the physicians obtained oral information, although to a much lesser extent in comparison with reliance on their colleagues and other sources. It appeared though that the broadcast media were considered particularly very useful during some unique events, such as when there was an epidemic, in supplying demographic trends and other types of updates. Two clinicians affirmed this by saying:

*The media to some certain extent [in providing medical information] especially during periods like that of the Ebola epidemic, there was a lot of media campaigns and enlightenment (Interview 1, Male, Resident).*

*...during the Ebola outbreak, everyday there is news and information about one or two things... (Interview 9, Resident, Male).*

One clinician's view was that *'some [of those] talks on the television and radio are really nice and expository'*<sup>59</sup>. These views confirmed the fact that some clinicians found the broadcast media as a useful source of medical information in some peculiar circumstances.

### **Information from patients**

In order to successfully treat a patient, obtaining oral information from that patient was described by one physician as *'the first level of information'*. The reason why this information was necessary was highlighted by what this physician further said; *'[it] gives me the background knowledge and helps me to investigate a case...without that information it will be very difficult to handle cases correctly and get the right results'*<sup>60</sup>. Another clinician also buttressed the importance of obtaining oral information from patients. He said:

*"If you encounter a problem or you are not getting the desired results, you have to check your procedure right from the initial contact with that patient. Sometimes it might be that*

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<sup>58</sup> Interview 4

<sup>59</sup> Interview 4

<sup>60</sup> Interview 17

*the patient did not volunteer enough information. There might be things that they didn't tell you because sometimes it is really difficult to get information from patients for you to know exactly what is wrong with them....When you come back and you have another contact with that patient you might find out that the information the patient was holding back might be the very thing that if you hit it will solve the whole problem".* (Interview 2, Resident, male).

The clinicians routinely engaged in obtaining this *first level of information* during patient care. A clinician noted that; *'if you are going to evaluate a patient you need information from that patient'*<sup>61</sup>. The perception behind this is that this information enhances the possibility of making the correct diagnostic evaluation for that patient.

### **Information from people in the community**

The clinicians were introduced to the practice of obtaining oral information from the community as part of their training on community medicine and public health. Discussing in this vein one clinician said; *'...in the 5<sup>th</sup> year, as part of your exposure to community medicine, that is, public health, you have to go into the community and interact with them....'*<sup>62</sup>. During actual medical practice, obtaining oral information from the community was more pervasively engaged in by physicians in the community medicine unit, as one of the means to monitor health conditions among the populace within their area of coverage, in order to be aware of any disease outbreaks.

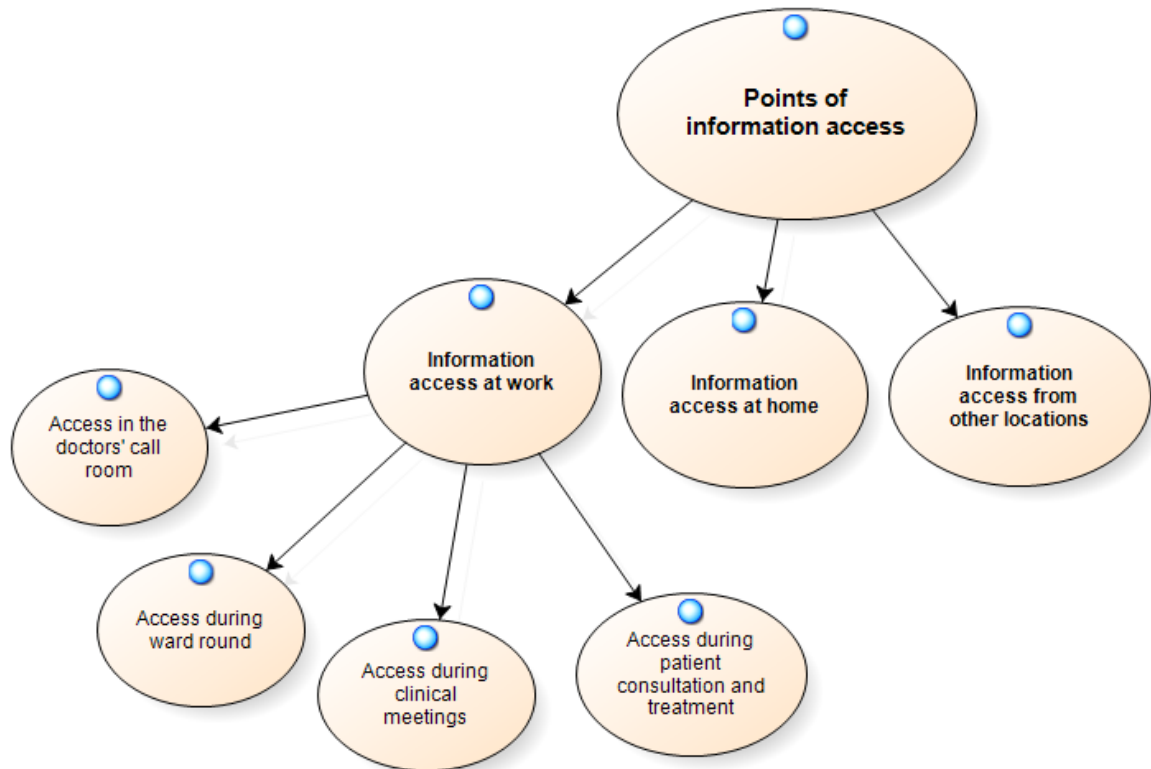
#### **4.8.3 Locations at which the physicians access information**

In general, the paediatricians' access to information towards the discharge of their patient care roles and professional development was done at three locations; at the workplace, at home, and other locations outside their hospital. This is shown in figure 34.

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<sup>61</sup> Interview 10

<sup>62</sup> Interview 1



**Figure 34: Points at which the physicians accessed information**

### **Information access at the workplace**

The physicians revealed in majority of the interviews that people engaged in the practice of accessing information while at work. This practice occurred at several points within the hospital; access in the doctors’ call room, access during ward rounds, access during clinical meetings, conferences and seminars, and access during patient consultations and treatment.

#### ***Access during clinical meetings, conferences and seminars***

During clinical meetings, conferences and seminars, people exchanged ideas and generally share knowledge among themselves. Comments revealed that these activities were held very often during the weekdays, Monday to Friday. One interviewee described what usually happens at those meetings:

*“[...] every Monday morning there will be clinical meetings to review difficult cases. At that moment, we are exchanging information and learning. On Tuesdays we have what is called postgraduate seminars where somebody presents what he or she has researched on. This is also an avenue for learning. On Wednesdays, units present an analysis of the difficult cases they managed and how they applied the standard or newer modalities concerning that case. I think that every day we have a way of acquiring knowledge [...]”.*  
(Interview 10, Resident, female).

This discussion forum which according to this clinician, '*happens regularly*' was also in her view, able to offer opportunity for the physicians to '*learn*' and to '*keep up to date*'<sup>63</sup>.

### ***Access during patient consultation and treatment***

Many interviewees agreed that seeking for information at the point of patient evaluation or treatment happened regularly among the physicians. Obtaining information in this way was said to take place through means such as brief discussion with a colleague, a quick browse through books, computers and other i-media (smart phones, iPads), and phone calls to other physicians. Some clinicians made statements that mirrored this type of information practice. Key words in the comments are deliberately highlighted to show the context of information access during patient consultation:

*"[...] but when I discussed with my colleague who was with me right there in the clinic, there were other things we found out". (Interview 2, Resident, male).*

*"Even at the point of care one can source for information. Nobody knows it all. Your memory may fail at that moment to remember what you learnt back in the medical school days, so you need a place where you can easily check-up information. You may even have your books around or your computers or tablets around to check-up whatever you think is not too clear about a patient". (Interview 10, Resident, female).*

*"I am always consulting with my iPad by my side because it gives me quick information whenever I need to do a check on anything" (Interview 12, Registrar, female).*

*"We had in the last few days a baby that came in the new born unit and was suffering from one rare condition that we had always read about but had not handled before. My colleagues used their phones to start searching on what to do on the type of prescriptions and treatment to be given". (Interview 14, Consultant, male).*

### ***Access during ward round***

Participating in the ward rounds afforded the paediatricians another opportunity to access information relevant for building their knowledge. The main sources of information during the ward rounds were the Consultants, discussions among team members, and the use of i-media sources for quick search.

Specifically, the ward rounds were used as training programmes for the junior physicians, and during that time, the consultants usually passed on useful knowledge to those in their teams. This information activity was attested to by this clinician who said that '*the consultants*

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<sup>63</sup> Interview 9



educate us the younger doctors during the ward rounds'<sup>64</sup> and another who learnt about information sources during a ward round:

*[...] during the rounds with the consultants they told us the sources that could be helpful so like that we picked up on the beneficial information sources". (Interview 13, Resident, Female)*

Ward rounds provided a forum for team members to engage in discussions, knowledge sharing and other collaborative information activities as was attested to by these comments from some clinicians:

*"I remember a time during ward round there was an issue and one of us instantly browsed on his phone and got the information we needed which helped us in treating that patient". (Interview 14, Consultant, male).*

*"[...] if you have information you will pass it on to your colleagues during ward round and we discuss [...]" (Interview 19, Consultant, male).*

*"[...] during some ward rounds, some patients can present with bizarre presentations; something that is not specific. Even at the bedside, you can google or browse for more information or search to refresh yourself on something you have read before but have forgotten the typical presentation". (Interview 5, Resident, Male).*

### ***Access in the Doctors' Call Room and Lounge***

As obtainable in many other departments of the hospital, Doctors' Call Rooms were provided at the different units of the paediatric department for intermittent rest and for securing personal effects, when the physicians were on duty<sup>65</sup>. This location served as a point where people engaged in information search, particularly when faced with an immediate challenge during patient care, such as described by this physician:

*"When you are seeing it [an ailment] face to face, even what you've learnt might look obscured and not be too vivid anymore, so I used to go back to the call room to brush up my knowledge with my computer or my books". (Interview 10, Resident, female).*

The researcher observed that the call rooms had television sets with satellite connection that provided news and entertainment from an array of stations. One clinician believed that some of the television programmes on some sparse occasions provided him with useful medical information<sup>66</sup>.

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<sup>64</sup> Interview 9

<sup>65</sup> Some of the researcher's interviews with the physicians were conducted at the call rooms at the three units of the hospital's paediatric department, affording him opportunity to observe first-hand how people used this venue for information search while on duty.

<sup>66</sup> Interview 3

Similarly a doctors' lounge exist at the hospital-wide level where physicians meet to unwind from stress, have dinner and generally interact among themselves<sup>67</sup>. One resident's view about the lounge on information sharing is that:

*"It is always important to visit the doctors' lounge where ideas are shared. Sometimes one can pick up solution to a problem one had encountered in the course of the discussions or a new treatment procedure from people who have attended conferences and workshops elsewhere"* (Interview 17, Resident, male)

The paediatricians perceived the discussions in the lounge as an avenue for obtaining useful medical information from colleagues in the different departments of the hospital.

### **Information access at home**

There was a general consent among the physicians that one of their information practices was engaging in information search activities while at home and off patient care duties. One significant reason given for this practice was because of the absence of immediate pressure from patient care duties at home. This Consultant made reference to that factor with these statements:

*"[...] my laptop and internet access helped me to access the information that I needed. But you know at that point in time I could not do that and I had to go home to be able to do that and come the next day to use the information I got. I provided access for myself and I couldn't do it in the hospital. I needed to go home and do it [...]"*.

*"I have bodies I belong to that send me updates on new researches and other information that I receive on my smart phone and then check on them more thoroughly when I get home".* (Interview 15, female and Consultant).

Another reason that necessitated this Consultant's preference for conducting information searches at home was her perception of the hospital library as not offering any form of advantage. She said; *'I have not seen any added advantage going there [the library] to access information that I cannot easily access in my house'*.

This tends to echo the sentiments of many others who would rather not use the hospital library. A Resident physician also muted the notion of freer time as encouraging people's information search at home:

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<sup>67</sup> During a particular visit to collect a participant's Diary in January 2016, the researcher was invited by a Resident to the doctors' lounge. That invitation afforded the researcher the privilege of observing physicians from different departments of the hospital discussing about diverse issues in a relaxed atmosphere. Most of the topics they discussed were related to patient care and some challenges they encountered. Sometimes there were lengthy arguments, but there always seemed to be an overriding view which many eventually accepted.

*“After the normal treatment and contacts for the day, for those in the wards, you go back home and do more research [...]”* (Interview 2, Resident, male).

In situations where the physicians encountered a serious challenge that needed to be researched on during patient care, most times people were asked to do so individually at a later time. What people usually did in those circumstances is mirrored by this case:

*“So, we were trying to clarify and everybody was asked to go and read about these conditions to verify the typical presentations in a child. So people went home and checked up textbooks and the Web, came back and discussed and arrived on something.”* (Interview 5, Resident, Male)

### **Information access at other external locations**

Physicians accessed information relevant to patient care at locations outside of the hospital such as when they attended externally organised conferences, seminars and workshops. The hospital provided limited sponsorships for the physicians to some of these external conferences hence affording people the opportunity of engaging in knowledge sharing with colleagues from elsewhere. As some clinicians said:

*“The hospital sponsors people once in a while for update courses where we meet other colleagues and lecturers who teach on specific courses [...]”*. (Interview 10, Resident, female).

*“When we attend [those] conferences and workshops we get a lot of information, especially conferences that are tailored towards sub-specialties, you get information about your own sub-specialty [...]”*. (Interview 15, Consultant, female).

Discussing about some of the information literacy trainings available during her residency programme, a Senior Registrar described how locations external to the hospital afforded people opportunity for information access. She said:

*“During residency I attended conferences and seminars where we were taught how to do research and how to conduct information searches. We were taught research methodology and how to use the internet for information search. We were introduced to the use of PubMed for obtaining medical information”* (Interview 11, Senior Registrar, female).

There was a widely acknowledged view among the clinicians that people were very open to the practice of sharing the knowledge obtained from those external locations and sources with their colleagues, on return to the hospital.

#### 4.8.4 Sources the physicians use for obtaining medical information

The coding process for the interviews revealed four categories of sources which the physicians use for obtaining medical information including print sources, electronic sources, people, and pharmaceutical companies as shown in figure 35.

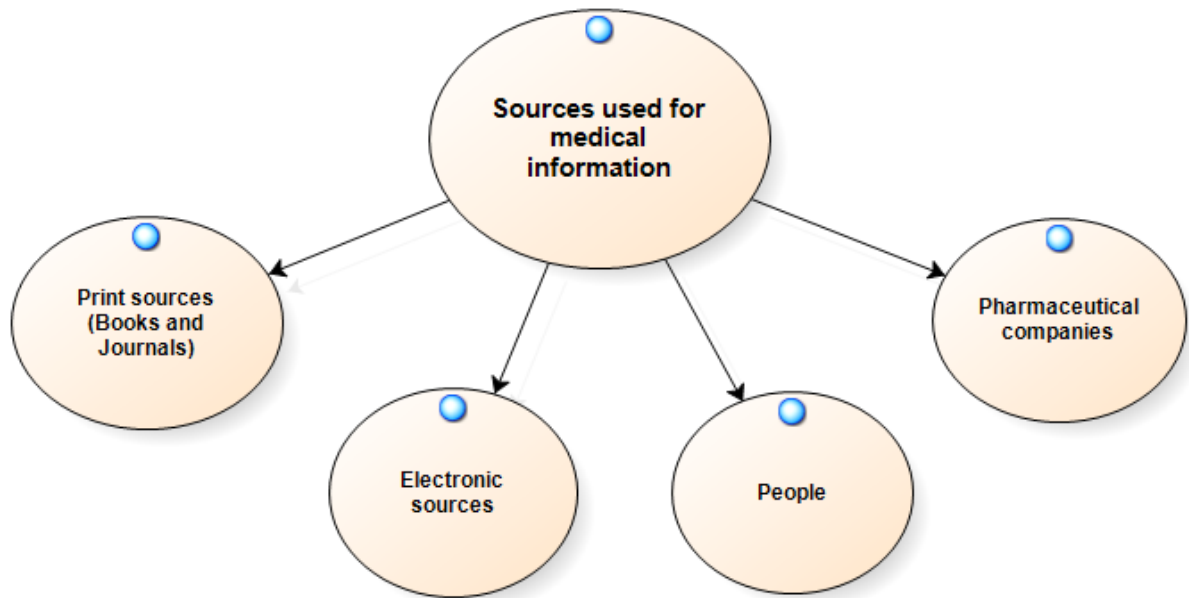


Figure 35: Sources used by the paediatricians for medical information

##### *Print sources*

The interviews revealed that the print sources of medical information the physicians use were in three formats; books, journals and pharmaceutical leaflets.

- **Books**

Every participant in the interviews mentioned using books as a source of obtaining medical information in the course of the discussions. The Nelson textbook of paediatrics was the most popularly used paediatric textbook by the clinicians. An incident count from the interview manuscripts, of the number of times people made reference to the use of books for obtaining information is presented in table 6.

**Table 6: Number of times book use was mentioned as source of medical information**

<b>Interviewee</b>	<b>Rank</b>	<b>Gender</b>	<b>Book use (times mentioned)</b>
1	Resident	Male	6
2	Resident	Male	4
3	Resident	Male	5
4	Registrar	Female	5
5	Resident	Male	6
6	Resident	Female	7
7	Resident	Male	3
8	Resident	Male	2
9	Resident	Male	3
10	Resident	Female	4
11	Senior Registrar	Female	3
12	Registrar	Female	2
13	Resident	Female	4
14	Consultant	Male	1
15	Consultant	Female	2
16	Resident	Male	4
17	Resident	Male	2
18	Resident	Female	2
19	Consultant	Male	5
20	Resident	Female	2

The information on Table 6 suggests that the practice of using books to obtain medical information was more common among the resident physicians than for other ranks, in view of the frequency of mention it received.

In view of this finding that the resident paediatricians' utilised textbooks more than their colleagues in other ranks, the researcher conducted a Facebook Messenger chat with some of the resident paediatricians<sup>68</sup> in order to ascertain how current the copies they utilised were.

The following questions were sent to respondents:

Researcher's Questions:

1. My study indicates that the most utilised paediatric textbook was the Nelson textbook of paediatrics. If you have a personal copy, can you tell me which edition(s) you have?
2. Can you tell me the range of editions your colleagues have as personal copies, and also the editions in the Paediatric department and hospital libraries?

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<sup>68</sup> Facebook Messenger chat with some resident clinicians conducted on the 17<sup>th</sup> and 18 of May 2016, to obtain further information based on findings obtained from the data analysis.

The response of the resident paediatrician, who was interviewee 1 during the interview data collection phase, reflects the majority of views:

*“The editions [clinicians have] range from 16th to 20th editions, the latest being 20th edition which is still new in the market. What I use is 19th edition and the text book is available in the departmental library which has both 18th and 19th editions. Last I knew the hospital library had [was] 18th edition”*

Given the length of time it takes to review major textbooks, often ranging between three to five years, it therefore, surmises that those paediatricians who relied on the 16<sup>th</sup> or 17<sup>th</sup> editions for their clinical decisions, were applying medical information of approximately twelve to fifteen years old, or more. During the interviews, interviewees constantly alluded to the frequency with which new medical information supersedes old ones, thereby changing modes of practice and knowledge. This might indicate that those old editions of the Nelson textbook of paediatrics which residents predominately utilised, particularly the 16<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> editions, could contain dated, superseded information, unsuitable for decisions in current paediatric care.

- **Journals**

The interviews also revealed journals as the second print source which the physicians used for obtaining medical information. Eighteen persons mentioned journals as a source which they used for obtaining medical information. The frequency with which people mentioned journal use was less than books as shown in table 7.

**Table 7: Number of times journal use was mentioned as source of medical information**

<b>Interviewee</b>	<b>Rank</b>	<b>Gender</b>	<b>Journal use (times mentioned)</b>
1	Resident	Male	1
3	Resident	Male	1
4	Registrar	Female	1
5	Resident	Male	2
6	Resident	Female	4
7	Resident	Male	1
8	Resident	Male	1
9	Resident	Male	1
10	Resident	Female	2
11	Senior Registrar	Female	2
13	Resident	Female	1
14	Consultant	Male	2
15	Consultant	Female	1
16	Resident	Male	1
17	Resident	Male	1
18	Resident	Female	3
19	Consultant	Male	3
20	Resident	Female	2

When Tables 6 and 7 are compared, the frequency with which the physicians mentioned use of books and journals, indicate that the physicians had a tendency to rely more pervasively on books than journals, as source for obtaining medical information.

### **Electronic sources**

Comments made during the interviews indicate that the use of electronic sources as means to obtain medical information was not only gaining a wide acceptance among the paediatricians, but becoming a regular practice. Majority made reference to conducting their information searches regularly by logging on to medical sources on the internet. Some factors were alluded to as being behind the growth of interest in the use of the internet-enabled sources. One of such factors was the belief that *'the internet ...is always handy'*<sup>69</sup>, implying its ever-ready availability for use.

Another electronic tool that served the paediatricians the purpose of obtaining medical information was the use of smart phones and tablets to store and retrieve useful data, or to access medical resources via the internet. This method of accessing medical information seemed to have permeated people's information practice. One of the clinicians revealed that *'many of the doctors have access to the internet through [their] mobile phones'*. He also

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<sup>69</sup> Interview 2

commented on the type of data people stored on their phones. He said; ‘...some of us have drug formulary in our phones’<sup>70</sup>. One Resident revealed that she uses her phones ‘to access copies of [her] notebooks’<sup>71</sup>, that is, her class notes which she converted to digital format and stored on her smartphones. Besides her class notes, this physician discussed other sources which she accessed through her phones. She said; ‘I like using Medscape, then there is e-Medicine, there is Mio-clinic and then Nice Guidelines, sometimes”.

Two other clinicians revealed aspects of what they used their personal i-media devices for. For one, it was to conduct quick re-assuring checks while consulting with his patients and the other, to monitor useful medical information from some specific online organizational social media:

*“There are times when you may not be too sure about something. It may even be just a little detail that is not immediately very clear in your mind, not that you don’t have any knowledge of it at all. That’s why I am always consulting with my iPad by my side because it gives me quick information whenever I need to do a check on anything”* (Interview 12, Registrar, female).

*“I use my electronic gadgets, my phone particularly to follow the WHO, UNICEF and other useful links from them on a daily basis. For example, recently I picked interesting information from one of the tweets from WHO on an ailment that grape seeds can cure, and shared the information with my colleagues”.* (Interview 17, Resident, male).

Some other physicians were equally aware of, and also use a few other electronic sources. The other electronic sources people mentioned using include: Medline and HINARI<sup>72</sup>, Google scholar and Wikipedia<sup>73</sup>, PubMed, SCBI and Up to Date<sup>74</sup>, American Journal of Paediatrics<sup>75</sup>.

One more electronic information source a clinician was aware of and use was Tweeter. This clinician said that he ‘...use[s] Tweeter a lot for keeping up to date’<sup>76</sup>. He was the only person who mentioned using this source for obtaining medical information.

## **People**

The preponderance of narrations by the paediatricians of how they always obtained medical information useful for patient care during interpersonal and group interactions, indicate that

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<sup>70</sup> Interview 16

<sup>71</sup> Interview 10

<sup>72</sup> Interview 13

<sup>73</sup> Interview 14

<sup>74</sup> Interview 4

<sup>75</sup> Interview 8

<sup>76</sup> Interview 17



people represent a significant source of their medical information. In terms of the intensity with which these interactions yielded useful medical information, the physicians described interacting with colleagues within their field of practice as the most significant.

People severally mentioned obtaining useful information from other colleagues, but more significantly the consultants, during group and interpersonal discussions, ward rounds, and seminars, because of their *wealth of knowledge* and *wealth of experience*<sup>77</sup>. Information from people was also obtained through interactions with patients<sup>78</sup> and engaging with the local communities<sup>79</sup>.

### **Pharmaceutical Companies**

Many paediatricians described information about drugs and drug dosing as very significant in the process of treating their patients. Some of the physicians mentioned pharmaceutical companies as source of information about drugs which they obtained either in print or electronic form. The paediatricians said this information comes either from the leaflets included in the drugs or face-to-face interactions with representatives of the pharmaceutical companies who come to educate them about new or modified drugs.

One clinician described what he does when confused about the prescription to make for a child. He said:

*“What I do is first to read the leaflets from the pharmaceutical company and that gives me an idea of what to do in prescribing the drug”.* (Interview 19, Resident, male).

On the seminars organized by the pharmaceutical companies for the physicians, this same clinician said:

*“The pharmaceutical companies liaise with the hospital to organise seminars on drug presentations, like on most prescription drugs they come to tell doctors about their new products, the advantages it has over a previous product, they explain their trials and why they feel strongly that doctors should recommend that kind of drug”.*

#### **4.8.5 Information seeking by the paediatricians during critical incidents**

The physicians were asked during the interviews to think back to a specific critical incident that happened in the recent past and narrate what information action they took in that situation,

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<sup>77</sup> Interview 8

<sup>78</sup> Interview 2

<sup>79</sup> Interview 18

why they chose the information action and also what happened after they took the action. In order to understand whether there are differences among the senior physicians (Registrars/Consultants) and junior physicians (Residents), the analysis of each group's behaviour during the critical incident was analysed separately and presented in tables 8, 9, 10 and 11.

**Table 8: Resident paediatricians' information-seeking behaviour during a critical incident**

Interviewee		Incident description	Information needed	Information sources/resources used	Reason(s) for preferring the source/resource
No.	Gender				
1	Male	Patient presented with body swelling. Generalised lymph node enlargement. Skin lesions. Diagnosed much later with HIV.	Correct understanding of the ailment because laboratory investigations disproved initial diagnosis	1. Internet search 2. Books	1. Obtaining information to support doing a case report intended for a journal publication. 2. Obtaining basic pathological understanding of the case and for comparing with the internet
2	Male	Severe chest pain	Information needed to confirm or disprove what the physician suspected as sickle cell anaemia	1. Discussed with a colleague in the clinic	2. To be sure about all features of the disease because diseases and symptoms evolve
3	Male	No particular incident mentioned	Dosing information with interest on drug side effects	Not given	Not given
5	Male	Patient presented an atypical case with many differentials in initial diagnosis	To clarify the exact condition of patient	1. Textbooks 2. Internet search 3. Discussed with colleagues in the team.	2. To be able to compare based on the symptomatology and signs the patient presented with
6	Female	Patient presented with symptoms the physician was not sure of	To know what the exact case was and the best way to treat the patient	1. Textbooks 2. Journals 3. The internet 4. Discussed with colleagues	Not given

**Resident paediatricians' information-seeking behaviour during a critical incident (continuation of table 8)**

No.	Gender	Incident description	Information needed	Information sources/resources used	Reason(s) for preferring the source/resource
7	Male	One of the rare cases presented and the physician forgot the right thing to do	To refresh the memory on the right steps to take	1. Checked the internet 2. Consulted colleagues around at the moment	Not given
8	Male	A child that had macroglosia and other features that could not match any initial diagnosis	Information to reach a more definitive conclusion on the illness	1. Personal 'standard' textbooks 2. Discussion with colleagues	Using the hospital library wastes time
9	Male	Physician had no knowledge on drug information for a particular disease	Information on drug administration	1. Read drug leaflets 2. Called colleagues on phone	Not given
10	Female	A rare case that confused the physician about what it was	To understand the confusing presentation	1. called senior colleagues	Because the experience of a senior colleague could give a quicker solution
13	Female	Patient presented with septic shock and electrolyte imbalance	How to manage the deficit of potassium in the patient	Searched through personal textbooks	Belief that books will supply information quicker on how to correct the hypokalaemia
16	Male	Severe dehydration in many children with symptoms atypical to normal diarrhoea	To know the types of intravenous fluids to be administered to the patients	1. Searched through personal books 2. Searched the internet 3. Asked the opinion of consultants	The sources were thought to be able to provide quick access to the needed information

<b>Resident paediatricians' information-seeking behaviour during a critical incident (continuation of table 8)</b>					
<b>No.</b>	<b>Gender</b>	<b>Incident description</b>	<b>Information needed</b>	<b>Information sources/resources used</b>	<b>Reason(s) for preferring the source/resource</b>
17	Male	Child with atrophy presented with hydrocephaly. This was confusing because atrophy was supposed to cause microcephaly instead	Information was needed to understand and resolve the complication in presentation	Searched the internet	The physician used the internet as his most preferred source because: <i>'when we need information in such an emergency case ... you get what can help very quickly'</i> .
18	Female	Information on a suspected new incident of polio received by the community medicine team	Information to confirm or disprove occurrence of the polio virus case	1. Conducted inquiry within the community by asking people in order to identify the child.  2. conducted laboratory test on the suspected child	Engaging with the community was thought to be the first source for understanding disease outbreak
20	Female	A child that was in a state of unconsciousness as a result of misdiagnosis and poor treatment at the referring hospital	1. How to revive the child.  2. getting the right diagnosis of the ailment	Called the consultant on phone.	Belief that the consultant will have better knowledge of the alternative procedure

A synthesis of the information actions taken by the resident paediatric physicians when handling a critical incident as presented in Table 8, shows much greater dependence on inter-personal sources of information than other sources by the majority. The physicians in this cadre were more disposed to consulting their fellow physicians for information when faced with a critical patient-care incident.

Some of the justifications given for this preference in information action include that:

- 'using the hospital library wastes time';
- The consultant will have better knowledge of alternative procedure;

- The experience of the consultant will provide information quicker; and,
- In the event of the outbreak of an epidemic, consulting people in the community would be the first source of understanding the disease outbreak. [View of a physician in the epidemiology section (Interview 18, female, Resident)].

The elimination of time wastage in getting the needed information at the time of handling a critical incident appeared to be the overarching concern of the residents in such situations. Apart from this being the prevalent reason given for the consultation of colleagues during critical incidents, it was also the reason behind the use of internet search for information at those moments because the physicians viewed it as a quick means of obtaining information.

The count of the different sources of information used by the resident paediatricians during the critical incidents, from information supplied during the interviews is presented in Table 9.

**Table 9: Residents' information-seeking behaviour during a critical incident analysed by consulted sources**

Sources used the during the CI	14 interview participants		
	9 males	5 females	Total
Search on the internet	5	1	6
Specific database(s) in medicine	-	-	0
Hard copy book	4	2	6
Electronic book	-	-	0
Journal	-	1	1
Consulting fellow physicians	6	3	9
Pharmaceutical books/leaflets	1	-	1
Information from the community	-	1	1

From a count of the sources relied on for information by the Resident paediatricians during a critical incident, Table 9 shows that people readily relied more on consulting fellow physicians in those moments. 9 residents indicated that during the critical incident they consulted other paediatricians for information, particularly from the consultants.

Two explicit sources; the internet and hard copy books were the next sources consulted more as 6 residents indicated using each of these sources at the critical incident. The residents explained that the reason behind the use of books was that they were always handy since they carried personal copies for use at work. These books were frequently brought to their call rooms and used as reference sources in any challenging situation. The residents also explained that they had internet connection readily available on personal devices like phones, tablets and laptops which provided a quick means of accessing vital information.

Other sources of information such as; journals, Pharmaceutical books/leaflets, information from the community were not used significantly by the residents at critical the incidents. The Sources not used at all during the critical incidents by the residents were electronic books and conducting search on specific medical databases.

It was evident from the sources consulted, as indicated in Tables 8 and 9, that there was a general disposition among the residents towards seeking for information either from inter-personal or explicit sources to enable them take informed decisions about their patients during critical incidents.

The analysis of the information-seeking behaviour of senior physicians (Consultants and Registrars) during a critical incident is presented in table 10.



**Table 10: Registrars and consultant paediatricians' information-seeking behaviour during a critical incident**

Interviewee		Gender	Incident description	Information needed	Information sources/resources used	Reason(s) for preferring the source/resource
No	Rank					
4	Registrar	Female	A child in distress, not breathing well, was unconscious when admitted	What to do to resuscitate the child	<ol style="list-style-type: none"> <li>1. Called the consultant.</li> <li>2. Searched through the Nelson book of paediatrics</li> <li>3. Searched the internet</li> </ol>	<ol style="list-style-type: none"> <li>2. Used because in her view, the Nelson book of paediatrics is the most authoritative.</li> <li>3. Used because <i>'it helps [one to] understand how such cases have been treated elsewhere'</i></li> </ol>
11	Senior Registrar	Female	A very ill child that had sepsis	Child was placed on treatment but needed urgent change to a drug with higher potency.	<ol style="list-style-type: none"> <li>1. Discussed with senior colleagues.</li> <li>2. Searched through the internet.</li> </ol>	Not given
12	Registrar	Female	Patient with hypoglycaemia was admitted with a risk of convulsion or death if not quickly corrected	Repeated doses of dextrose failed to raise blood sugar, creating urgent information need on the right course of treatment	Called a senior colleague on phone	Because it was the most immediate means to get information to avert the danger
14	Consultant	Male	A baby that came in the new-born unit with a rare case that the consultant had not handled previously	The right prescription and course of treatment	Searched for information on the internet together with other members of his team	Was the quickest way to get the information
15	Consultant	Female	A strange case of child with kidney failure. The consultant said; <i>'we had a patient and I was at a loss on what could be the likely diagnosis in this child. We had the features there but did not know exactly what to do'</i> .	<i>"...information...that helped me make up my mind on the diagnosis for that patient"</i> .	Searched the internet	To be able to see several cases and compare with the features the patient presented.

Registrars and consultant paediatricians' information-seeking behaviour during a critical incident (continuation of Table 10)						
No	Rank	Gender	Incident description	Information needed	Information sources/resources used	Reason(s) for preferring the source/resource
19	Consultant	Male	A rare case which a child presented and the consultant was not very sure about the course of treatment.	Re-assurance that the right course of treatment was being followed	1. <i>'First of all I looked at the electronic copy of my book and read it'.</i>  2. <i>'Then... I went online, Googled it generally, before looking for specific sites. Especially there's one called e-Medicine in paediatrics'</i>	<i>'I went online to refresh my memory'</i>

Table 10 presents the information actions taken by the Registrars and Consultants when handling a critical incident and indicates that the sources of information people consulted varied in types. Overall the physicians displayed awareness of the importance of reliance on information for making or supporting their decisions in critical patient care incidents, as reflected in the use of the different sources. The analysis shows that the paediatric physicians displayed a purposeful reliance on explicit knowledge sources for taking patient care decisions during critical incidents.

The use of the various information sources as shown in Table 10 further indicates that the physicians possessed a positive disposition towards taking informed decisions during moments of pressure and uncertainty in patient care, such as in a critical incident. Some of the reasons advanced by the physicians on why they chose to take the information action include; understanding how the illness was previously treated elsewhere, refreshing the memory [on their tacit knowledge], to be able to compare what was obtained with what the patient presented [and therefore take a decision]. Others reasons are; to avert the immediate danger [with the information obtained], and to use an 'authoritative' source for taking a decision on the patient.

The different sources of information used by the Registrars and Consultants during the critical incidents as contained in Table 10 were counted and itemised in Table 11.

**Table 11: Registrars and consultant paediatricians' information-seeking behaviour during a critical incident analysed by consulted sources**

Sources used during the CI	6 interview participants		
	2 males	4 females	Total
Search on the internet	2	3	5
Specific database(s) in medicine	1	-	1
Hard copy book	-	1	1
Electronic book	1	-	1
Journal	-	-	0
Consulting fellow physicians	1	3	4
Pharmaceutical books/leaflets	-	-	0
Information from the community	-	-	0

From the count of the sources relied on for information by the Registrars and Consultants during critical incidents, Table 11 reveals that in those moments people readily relied more on conducting searches on the Internet. 5 interview participants out of 6 in this cadre revealed that they conducted searches on the internet for information during a critical incident.

The next information action which a greater number of people engaged in during the recounted critical incident was the consultation of fellow physicians. 4 of the interviewees revealed that they depended on this method for information support during the critical incident. Other means of getting information support such as; utilising hard and soft (electronic) copy of books and searching a specific medical database were least used. Only 1 interviewee each indicated using these sources during the critical incident.

Other information sources which the residents used during critical the incident but which the Registrars and Consultants did not indicate to have used include; journals Pharmaceutical books/leaflets and information from the community.

#### 4.8.5.1 Clinicians' perceptions about information use in critical incidents

The researcher's interviews with the paediatricians sought their perceptions on whether the information they used in the process of managing the critical incidents made any contributions to the eventual outcomes of caring for those patients. Some comments indicating interviewee perceptions are as follows:

*"[...] I did everything I could to resuscitate the patient, and then call the consultants. You know that happened just like a month ago. I had a case like that in children emergency we reviewed the case, the consultant came in and gave her own input then we all went back to research because the patient was unconscious for some time, for days, but eventually the child came out and was discharged"* (Interview 4, female, Registrar).

In the foregoing incident, the clinician's view suggests that information from the consultant and the team's research contributed to the successful management of the unconscious patient who became well and was eventually discharged.

Similarly, the paediatrician who handled a case of patient in septic shock and with electrolyte imbalance (Table 8) and who admitted that: *"At the moment I was treating the patient, the picture was not very clear in my mind on how to manage the deficit of potassium that the child already had [...]"* (Interview 13, female, Resident), searched through her textbook to determine how to correct the deficit of potassium. Her perception of that information use was that: *"The patient got better when I applied the formula for the correction of the potassium deficit which I got from the book"*. This clinician perceived a direct link with the critically ill patient's recovery to the evidence-based treatment she applied as a result of information got from her book.

Another clinician who managed a critical incident in which she was not sure of the symptoms the patient presented (Table 8) said: *"...but I wasn't sure what I was dealing with, so I had to go back to source for information on what exactly it is and how best to help this patient. So I searched my textbooks, journals and the internet. At the end of the day, I was able to solve the problem"* (Interview 6, female, Resident). This clinician further narrated her perception of the contribution the information she got from the consulted sources to managing the patient with a successful outcome:

*"[...] at the end of the day I realised that the patient needed to be referred to a Gynaecologist. It was a child of four years. The child had a problem and I wasn't sure what it was, but it was a vaginal bleeding. From the information we gathered we understood that*

*the case was a urethral prolapse and that the child can get more help with a referral to a Gynaecologist. This actually was the case, because the mother came back to report to us that the problem was solved” (Interview 6, female, Resident).*

In similar vein, a team in the new born unit which managed a rare case which was critical because the consultant admitted that it was ‘...one rare condition that we had always read about but had not handled before’. The team set about a group information search on ‘... what to do on the type of prescriptions and treatment to be given” in order to overcome their lack of knowledge on how to manage the case. The eventual outcome of the application of the information the group got from their search to caring for that patient was narrated by the consultant:

*“We were able to manage that child based on what we discovered and also gave the parents counsel on the post-treatment care for the child”. (Interview 14, male, Consultant).*

The information received through the group’s search was perceived by the consultant as not only useful to the team for successfully managing the patient’s illness, but also as medium through which the team was capable of providing counsel to the patient’s parents on how to manage the child’s recovery process.

In the case of the child with hydrocephaly, a disease causing an increase in the skull’s proportions, the clinician narrated that:

*“The patient was stabilised and managed based on the information we gathered. When we collated our findings, we arrived at a decision on how best to treat the case which was done with improvements noticed in the child’s case” (Interview 17, male, Resident).*

Considering the foregoing comments by interviewees, it was obvious that many paediatricians perceived that their conscious search for, and use of information in the process of managing the critical incidents they described, contributed to the outcomes of patient care.

#### **4.9 Theme five: Information literacy needs**

In order to assess the clinicians’ perception of their information literacy abilities, one of the interview questions required people to describe; a) the aspects of their ability to access and use information they felt were particularly good, and; b) the aspects that could be improved or enhanced.

Data gathered from participant responses to these questions was aimed at contributing to achieving the first specific objective of this study in providing understanding of:

- The physicians' awareness, perception and experience of information literacy for patient care.

There was a general admission of inadequacy by clinicians over their personal capabilities in the knowledge of information sources. Although a few felt they were very good in using resources on the internet, many admitted possessing limited ability for successfully navigating around and accessing the information resources they needed from online sources. Some of the information literacy needs of the clinicians in this regard ranged from '*how to recognise good sites*'<sup>80</sup> to '*Knowing how to find information*'<sup>81</sup> because in the view of this clinician:

*"Some of us know about a few medical sources of information, but have no real knowledge on how to access and use them, especially the electronic ones, so some training will be beneficial to us"* (Interview 5, Resident, male).

A consultant admitted his limitation in the knowledge of online medical sources:

*"[...] one of the limitations I have is that I don't know too many sites and databases. It used to be only PubMed, Medscape until someone told me about Google Scholar recently"*

This admission by one of the most senior doctors indicates that this limitation in the information access capability of people could cut across the entire rank of the paediatricians.

Other limitations faced by the clinicians include not possessing adequate skills to understand the technicalities of navigating some online sources. One clinician noted that there were '*technical difficulties associated with trying to browse some sites on the Net [which are] very discouraging ....*' Similarly one clinician also admitted; '*there are sites [he finds] difficult to access*'<sup>82</sup>. The clinicians generally accepted the necessity for information literacy training for increasing their knowledge and capacity for information use in general and particularly from online sources. Some of the clinicians said:

*I think it will be necessary for the hospital to organise a workshop to train doctors on how to source for medical information from the various sources available* (Interview 5, Resident, male).

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<sup>80</sup> Interview 10

<sup>81</sup> Interview 14

<sup>82</sup> Interview 17

*I think everybody here will benefit if the hospital puts up a training course for doctors on how to access and use information from sources relevant to their fields, particularly the internet based sources (Interview 20, Resident, female).*

One area the majority of clinicians suggested improvement was in their ability to conduct targeted information search that eliminates the waste of time and effort which follows retrieval of bulk irrelevant materials during online search. They felt that what was needed was ‘...particularly how to narrow down your search in order to get the specific information you were targeting’<sup>83</sup>. This is because as one participant noted: ‘the general search ... on the Net throws up a lot of thrash sometimes and leave [people] with a problem of choice’<sup>84</sup>.

It was evident from clinicians’ comments that people had a positive perception of information literacy and awareness of the necessity for possessing information capabilities needed to inculcate good information practices for patient care. Specifically, the clinicians understood the facilitating role of possessing such competence on their ability to; locate evidence sources, access and correctly use it in patient care decisions.

It was also generally perceived that there was a lack of uniformity about clinicians’ individual capabilities for ensuring good information practices during patient care. Due to these notions, interview participants generally considered training on information capacity building necessary for all the clinicians.

#### **4.10 Conclusion**

In this chapter the interpretative analysis of the interview data was conducted and presented following a structure of themes and sub-themes that emerged from the coding process. The analysis was useful for highlighting the information experiences and practices of the paediatric physicians. The next chapter presents the interpretative analysis of the data obtained from participant diaries.

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<sup>83</sup> Interview 15

<sup>84</sup> Interview 20

## Chapter Five

### Analysis of Participant Diaries

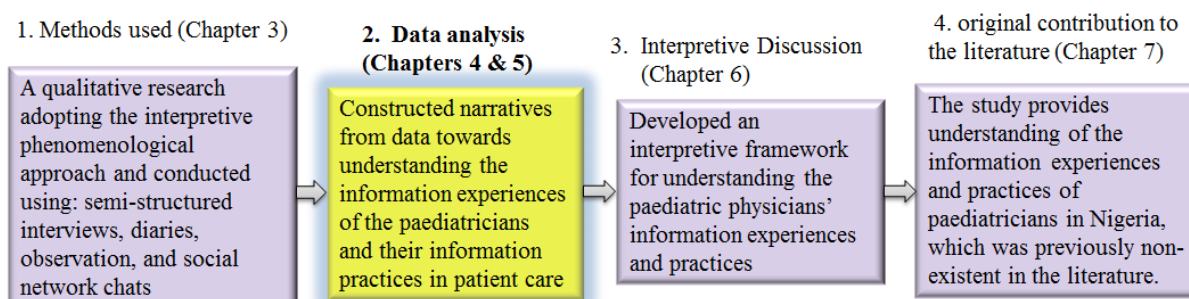


Figure 36: Method of participant diaries data analyses

#### 5.1 Introduction

This chapter presents the interpretative analysis of the personal reflections of the clinicians contained in the diary records. This was conducted with the aim to relate the data with the previous analysis done in chapter four for understanding areas of concurrence or divergence with themes generated from the interview analysis.

The construction of narratives from the self-report's was done as a way to enable appropriate understanding of the clinicians' information practices for patient care from the perspective of personal reflections uninfluenced by the presence of the researcher. The narratives provided answers to the research questions and overall, contributed to achieving the aim and objectives of the study.

The exact diary records for each of the seven participants are presented in tables at the appendices section as Appendix 6.

#### 5.2 Theme one: Information experiences

The analysis done under this theme contributes to answering the first research question of this study:

- What information experiences do paediatric physicians in Nigeria have?



The analysis of the interviews exposed that there were differences and similarities in the information experiences of the clinicians at the local social, wider cultural and individual contexts which impacted their information practices during patient care.

Similarly, the diary analysis revealed some co-shared and unique information experiences among the clinicians. One of the co-shared experiences was exposed by the diary data. The challenge was in the information search experience encountered by clinicians highlighted by participant 2, a senior registrar on the *dearth of local information resources* on the subject in which he sought information<sup>85</sup>.

However, in contrast to the report of participant 2 about the dearth of local resources experienced during an information search, participant one's diary record on a Friday shows that the information resources obtained from a search on the current management of acute severe malnutrition was limited to sub-Saharan Africa. The clinician's interpretation of this factor was that it could be owing to the illness in question not being very common in the western countries.

It appears therefore, that availability of medical information resources from a particular geographical region in an information search was dependent on the prevalence of the type of illness that the information was required on within that region.

This tendency for social and geographical peculiarities of regions to affect disease occurrence and medical literature on it, tends to influence resource availability for the clinicians. This factor provides a new focus on the *social factors* that affect the information experiences of the paediatricians, different from the findings in the interviews. It tends to basically contribute in providing answers to the third research question for this study:

- Does the paediatricians' information experience have implications for their information practices and patient care?

Although the analysis under this theme primarily provides answers to the third research question, however, where the context of the discourse is intertwined, it also provides answers to the second research question:

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<sup>85</sup> A dearth of local information resources is a negative information experience of the paediatricians in Nigeria which could have implications for their proper understanding of the tropical contexts of disease management. This factor partly addresses the third specific objective of this study that seeks to provide understanding of the inhibitors to the physicians' information experiences and information practices for patient care.

- In what ways do paediatric physicians in Nigeria engage in information practices towards patient care?

A senior registrar's complaint that '*most of the textbooks in [the] hospital library are outdated*' as the reason for his using the internet for accessing needed information during a Thursday information search, exposes another detrimental factor to the information experiences of the clinicians. This exposure aligns with the allusions made during the interviews to the fact that majority of the resources in the hospital library were not the current ones. It therefore, reiterates the *out datedness of information resources* as a barrier people encounter in using the hospital library as was noted by the interview participants.

The Monday diary record of participant 7, a resident, indicates that this clinician was involved in outpatient clinical consultations until 4.00 pm. The only activity this participant engaged in on the day outside that was the morning review of patients' cases at the emergency unit. Clinicians generally complained about the pressure of work limiting their information activities owing to the length of time spent in consulting with patients, as with this case. One of the researcher's observations was that the clinicians commence consulting with patients at the paediatric department by 10.00 am after the morning reviews of patients admitted in the wards. Under the analytical category of *factors affecting the paediatricians' information experiences*, one of the *personal factors* physicians explained during the interview analysis as negatively influencing their information-seeking experience was the *lack of time* associated with the pressure of patient care and administrative duties for clinicians in the consultant ranks.

The information activity on a Sunday for participant 2, a senior registrar, involved the moderation of a group discussion type of information sharing activity among a group of residents preparing for an examination using *past questions* as guide. The *discussants used personal i-media devices for accessing information electronically*. The group experienced *lack of power supply* as the information access barrier to extended use of their devices. The lack of consistent power supply was a social factor that impacted negatively on the information experiences of the clinicians through the disruptions to the access of electronic information resources.

The information activity recorded on a Thursday by participant 3, a resident, shows the existence of learning in practice. The clinician's search for supporting evidence from online sources provided information through case reports. This reflects an evidence informed

practice that was useful for arriving at a *definite diagnosis* of the syndrome. The practice of extended collaboration in information sharing was demonstrated by this paediatrician's team's phone call to senior doctors at other hospitals in order to get their opinion about the illness.

The Monday diary records of participant 4, a consultant revealed the participant's information need on comparing the definitions of hypoglycaemia was met by consulting online sources. The specific online sources used were however, not mentioned, but the sources proved useful for clarifying different definitions of the illness and also helped treat a patient along that line.

Participant 6, a resident, reported a challenge he encountered on a Tuesday, which was that *'some colleagues consulted were not very sure of the answers sought'* on the information need *'concerning types of stridor and treatment based on whether upper airway is involved or not'*. This factor of people being unsure about information colleagues request from them probably weakens the suitability of the residents' pervasive use of interpersonal information, for making clinical decisions during critical incidents, as was reported in the interview analysis. It exposes the potential lack of correctness of interpersonal information, as a challenge to the use of this information medium by the clinicians.

**Obtaining unreliable information** was perceived as one of the factors affecting the clinicians' information experience in terms of their disposition on the use of some information sources. The interview data in contrast, highlighted the unreliability and contradictoriness of medical information obtained from the internet, as a deterrent factor to some clinicians use of the source.

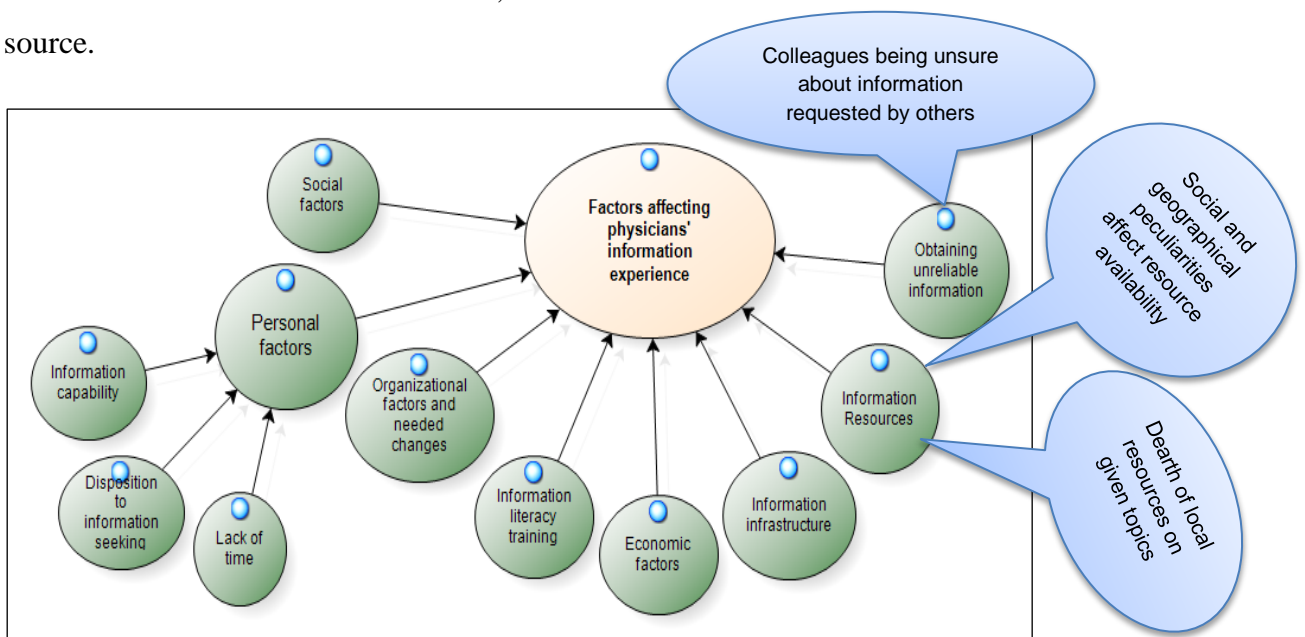


Figure 37: Factors identified from diary data on the clinicians' information experiences (in blue bubble)

The cumulative factors that influence the clinicians' information experience shown in figure 37 as elicited from the entire data set clearly suggest potential implications for their information practices and patient care. These implications were fully addressed under the discussions in chapter six.

### 5.3 Theme two: Information needs

Data analysis under this theme contributes to answering the second research question of this study:

- In what ways do paediatric physicians in Nigeria engage in information practices towards patient care?

Analysis of data from the interviews on the theme of the clinicians **information needs** suggests the existence of a good degree of awareness among the clinicians about their need for information in support of patient care. There was a similarity between the diary data and the interviews on this factor of awareness of information needs. Diary records tend to indicate that most of the clinicians were both aware of their needs for information and able to identify reasons for the information need.

Participant 1, a resident, explained in a Thursday diary record that his need for information on muscular dystrophy disease was to enable him understand its geographical peculiarities in management. Participant 5, a resident, recorded *personal reading* in preparation for an examination as his information activity on a Wednesday. This information activity was in consonance with the *need to pass examinations for career progression* as one of the precursors of the information needs of the junior doctors, particularly the residents.

Participant 3, a resident, records that his team on a Monday obtained drug dosing information using the '*...drug formulary for precise dosing of some medications [they] needed to prescribe*' for a patient at the bedside. This information activity reflects one of the reasons for the paediatricians' need for information which was for *obtaining information about drugs and dosage*. It similarly reflects the growing practice among the clinicians in the use of documentary evidence (in majority of cases from online sources at the point-of-care) to support their clinical decisions.

This resident's team applied the knowledge obtained from a bedside information search on the dosage and pharmacokinetics of the drug Baclofen from the British National Formulary, to be

able to make a prescription for a patient. One of the reasons adduced from the interviews on why the paediatricians required information was for *obtaining information about drugs and dosage*. Participant 6, another resident, in a Tuesday diary record similarly required specific information on a method of patient evaluation and dosage of a drug. *Documentary sources of information*, reflecting one of the two forms of resources frequently used by the physicians, were used by this clinician to meet the information need. This led to ‘*appropriate dosing of Metoclopramide [and] better assessment of a female girl with suspected genital infection*’. In the process the clinician displayed not only awareness of his information need, but also ability to apply the obtained information to patient care.

#### 5.4 Theme three: Information use

Among the various information sources accessed by participant 1 on a Thursday in order to meet the information need on muscular dystrophy included the Nelson Textbook of Paediatrics which was discovered to be the most pervasively utilised paediatric text by the clinicians. The participant also used *The Forfar and Arneils textbook of paediatrics* for meeting this expressed information need. The use of this text represents a new source not mentioned during the interviews; however, the analysis of print information resources used by the clinicians during the diary record week indicates that this paediatric textbook was used by only this clinician during that week.

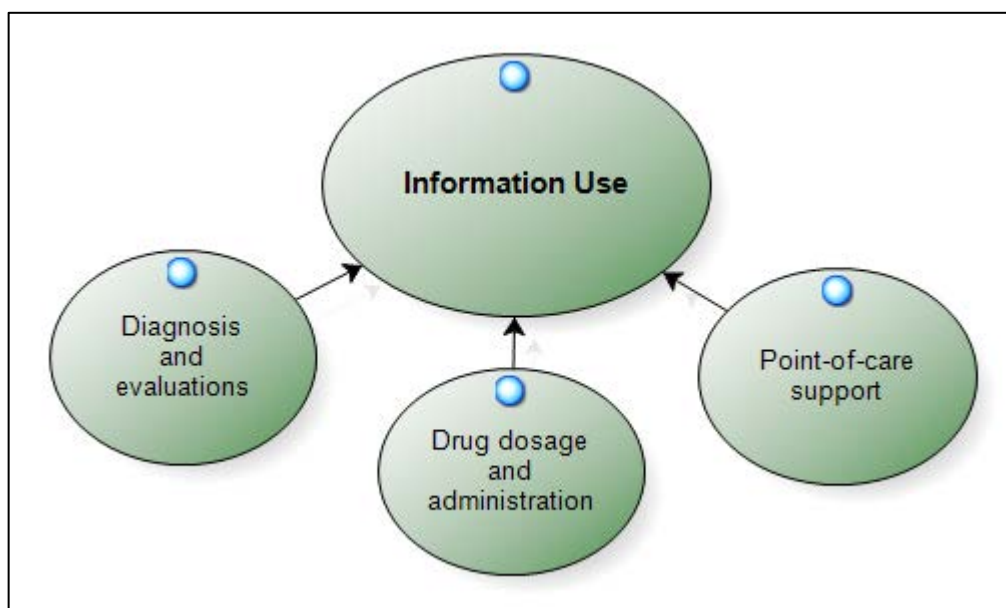


Figure 38: Theme and categories shared by interview/diary on information use

The Consultant’s ward rounds were uniformly perceived as a means through which doctors in lower ranks obtained useful medical information and knowledge. The diary records of

participant 2, a senior registrar, show that during the consultant ward round in which he participated, the team; ‘...had to consult the internet [in the course of managing the patient at the bedside] to see if there was any documented relationship and what better form of management [they] might give’. This action shows the existence of **point-of-care information access** to support clinical decisions reflected under the theme of **information use** in the interview analysis<sup>86</sup>.

The Monday diary records of participant 3, a resident, described how the junior physicians learnt from the consultant how to handle a social welfare issue of an indigent patient. The team relied on the knowledge of the consultant to contact the appropriate social welfare agency, demonstrating equally in the process, the role of **sensitising and counselling patients**, as one of the benefits of information use for the clinicians in patient care. Additionally, the knowledge obtained from the consultant’s application of his experience for solving the problem amounts to **learning in practice** for the residents.

The Friday diary records of participant 2, a senior registrar, shows the participant engaged in a mortality review and reports that ‘It provided a forum where case notes of deceased patients are analysed / summarized with the aim of finding ways of making future treatment better’. The interview data revealed that the physicians’ **avoidance of mistakes and clinical errors** was one of the perceived benefits of information use in patient care and the main objective of conducting mortality reviews. The information obtained from the death reviews was perceived as useful for avoiding future mistakes.

This participant also utilised textbook and the internet to obtain information on leukaemia with specific interest on the factors that affect its progress and outcomes in blacks. This reflects **understanding the geographical and contextual peculiarities of disease management** as one of the paediatricians need for information.

The Monday information activity of participant 4, a consultant, was to obtain definitions of hypoglycaemia by consulting online sources. Although the specific online sources used were not mentioned, the sources consulted were useful for clarifying different definitions of the illness and for treating a patient along that line of definitions. This information activity aligns

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<sup>86</sup> This factor relates to the first specific objective of the study which was to provide understanding of the physicians’ awareness, perception and experience of information literacy for patient care and shows the existence of the clinicians’ awareness of their information needs and its usefulness for patient care

with the interview analysis, which portrays the *support of decisions, diagnosis and avoidance of mistakes* as one of the reasons the paediatricians need information.

Participant 6, a resident, used mostly electronic sources on a Saturday information activity '*to verify drug dosages, indications and plan of management for specific ailments*'. The electronic sources used were *Medscape*, the most popular electronic source among the clinicians, *e-Medicine and Drug Reference* together with *BNF* [British National Formulary] which is a print source. The purpose for consulting the sources was for the clinician '*to be able to verify drug dosages, indications and plan of management for specific ailments*'. *Obtaining information about drugs and dosage* was identified in the interviews as one of the primary reasons for the clinicians' information needs.

The Sunday diary record of participant 6 further indicates that besides information needed for patient care, the clinician's other information need was in '*preparation for an English Language test*'. This factor buttresses the views clinicians expressed during the interviews that their information needs were not only limited to paediatrics alone.

#### **5.5 Theme four: Information seeking behaviour**

The interview data revealed that even though the clinicians' considered explicit sources, particularly textbooks as most authentic for making their clinical decisions, the *oral information* form was highly utilised source of their medical information. In reflection of this regular practice, the Wednesday diary records of participant 1, a resident, show his participation in a clinical seminar which he described as '*A forum for health workers (House Officers, Residents, Consultants, [and] Nurses) to have an in-depth look on a clinical problem*'. This clinician further noted that in the forum; '*opportunity [was] provided for questions and clarification*'. The Tuesday diary record of participant 6, a resident, shows the clinician was engaged in teaching the house officers, a rank immediately below the residents. This activity reflected the general practice of sharing knowledge existing among the paediatricians that defers to a power relationship of rank and experience.

The diary records of participant 7, a resident, on a Wednesday shows that people regarded the consultant's ward rounds as a forum for obtaining information. During the ward rounds, *oral information* was in this circumstance obtained through; '*a review of the paediatric cases under [the] consultant in the ward*'. The day's clinical seminar also provided the participant oral information on new trends in the management of acute kidney injury, a conscious reason

for participating in the information activity. The clinical seminars which the researcher observed were regularly held on Wednesdays were perceived by participants in the interviews as a forum where clinicians share medical information.

The clinical seminars provided opportunity for collegiate knowledge sharing among the clinicians in aligning with the sub-theme of *information from colleagues* as one of the oral forms of people's access to medical information. The reason given by the clinician for this information activity also aligns with the aim of clinicians' *coping with the evolution of diseases and symptoms* suggested during the interviews as a reason for information need.

The diary records of participant 4, a consultant, showed his participation in the same seminar indicating the importance attached to the activity within the department as an information sharing forum of all the clinicians. The Thursday diary records of participant 2, a senior registrar, shows that the doctor participated in a postgraduate interaction, which was a forum for knowledge sharing among colleagues in a *collaborative learning* arrangement, on 'topics relevant to [their] college exams'. The openness of the discussion forum which the senior registrar described as 'exclusive interaction for resident doctors in training' was indicated by his participation in it. This physician's participation in the discussion, despite the difference in the rank of the other participants, underscores the openness of some people to obtaining career-building information from any source germane to their information needs. It could also be interpreted as his positive disposition to knowledge sharing with clinicians in the lower ranks.

Similarly, a Tuesday diary record of participant 5, a resident, reveals this physician's disposition to interpersonal information seeking as evidenced in the comment that he 'Settled an argument with a colleague concerning adolescent health (characteristic changes during puberty in males) by consulting Nelson's textbook of paediatrics, and Medscape (Web search)'. The resources used by both clinicians to settle their argument were reminiscent of the most pervasively utilised print and electronic sources in other diary records and the interview data. The participant's disposition to *collaborative learning* was also shown by involvement in a discussion class with colleagues in preparation for the West African College of physicians Part 1 examination later in the day. The Monday diary records of participant 1, a resident, on day 3, also demonstrate the participant's practice of *collaborative learning* through his involvement in a *group academic discussion* among fellow residents.



Information need driven by the *quest to pass examination* was rifer among the resident doctors due to the immediate pressure of career progression. Nonetheless, the *culture of information sharing* existent among the paediatricians permitted colleagues from more senior ranks to join in those group discussions as a way of sharing their knowledge with the residents in preparation for the examinations.

Analysis of the interviews also revealed that interpersonal information exchanges in general were equally rifer among the resident clinicians. The Wednesday diary records of participant 3, a resident; reflected this trend with the report of an impromptu clinical conversation initiated by the participant with colleagues as means to obtaining information on a critical patient care incident. Besides this indicating a positive disposition to information seeking, it reifies results of the critical incident analysis from the interview data which revealed that resident clinicians were more prone to adopting interpersonal information seeking when faced with providing care to critically ill patients.

The culture of interpersonal information gathering was discovered in the interviews to be entrenched among the paediatricians. This method of *knowledge building was tailored towards seniority in rank and experience in its power relationships*. The Thursday diary records of participant 3, a resident, reveals how clinicians engage in this pattern of knowledge exchange by house officers making the resident the first line of information in a *moment of doubt* while diagnosing a challenging case. This action resulted in a collegiate effort by both clinicians to re-study the house officer's diagnosis, search and obtain more information, and eventually *used the information to confirm the diagnosis*.

The Thursday diary records of participant 4, a consultant, shows that the main reason for his search on the *internet* and *textbooks* for information on perinatal asphyxia were *to help guide a colleague* interested in that subject. The perception of knowledge authority, invested on consultants the responsibility of coaching and guiding other doctors below them in rank in both formal and informal learning encounters as consultants were the most senior doctors among the clinicians.

The Friday diary record of participant 5, a resident, indicates that the discussions held on that day among colleagues was “...aimed at solving several multiple choice questions in WAEP (West African College of Physicians) part I examination”. *Collaborative learning* was identified during the interviews as one of the means through which the clinicians increased

their knowledge. The most pervasive reason behind the clinicians' collaborative learning was for examination preparation by the residents.

One of the researcher's observations during the course of collecting data was that resident doctors utilised scheduled discussion classes as method of preparing for their residency examinations. This practice was reflective of *collaborative learning*<sup>87</sup>. The Monday diary records of participant 5, a resident, indicate that this participant went into the discussions with a specific information need - *on the standard definition of the various forms of relapse in nephritic syndrome*. This clinicians' purposive participation displayed awareness of information need and how to satisfy the need since involvement in the activity was consciously targeted at a required object of knowledge.

Tuesday diary records of participant 1, a resident, shows the participant engaged in *information sharing* by participating in a postgraduate seminar and also was engaged in *personal reading* at the hospital library, an *independent learning* activity. Similarly diary records by a senior registrar's diary record on a Tuesday and a resident on a Thursday respectively, confirm their engagement in *independent learning* through personal reading. The information sources used by the resident were *Medscape* and *Google* search, aligning with the interview findings on the paediatricians' use of *Medscape* in medical information seeking. The sources that provided information for the senior registrar were journals, textbooks and a search on the internet through a personal tablet computer. Participant 4, a consultant, also reported using the internet for his information search in his day four diary records.

Participant 1, a resident, in a Friday diary record indicates that *Medscape* and *Medline* and textbooks were the medical sources used for obtaining information. The clinician's use of *Medscape* was generally reflective of its being the most pervasively utilised electronic source among paediatricians. The Friday records of a consultant's information activities, participant 4, show his information activity was a discussion with members of the unit at the ward round reflecting the method of *knowledge sharing* prevalent among the paediatricians.

The consultant's utilisation of the *Nelson Textbook of paediatrics* and *Medscape* to obtain information about the management of a disease further supports the interview finding that both sources were respectively, the most pervasively utilised print and electronic sources of medical information among the paediatricians. Similar to majority of diary records,

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<sup>87</sup> This partly addresses the second research question; 'in what ways do paediatric physicians in Nigeria engage in information practices towards patient care'?

participant 7, on a Wednesday also used *Medscape* for meeting his information needs. The frequency with which participants the used the *Medscape* confirmed that it was the most popular and pervasively utilised electronic medical information source among the clinicians. This factor is reflected in the analysis on tables 12 and 13.

Table 12: Electronic resources used by the clinicians during the diary record week

<b>s/no</b>	<b>Electronic sources of information</b>	<b>Days used</b>
1	Medscape	13
2	American Journal of Paediatrics	1
3	HINARI	1
4	Medline	2
5	eMedicine	3
6	Wikipedia	2
7	Lancet	1
8	African Journals Online (AJOL)	1
9	USMLE Questions	1
10	Slide Share	1
11	Drug Reference	2
12	Web MD	1
13	PubMed	1
14	Online English Language Test aids	1

Table 13: Print resources used by the clinicians during the diary record week

<b>s/no</b>	<b>Print Sources of information</b>	<b>Days used</b>
1	Nelson's Textbook of Paediatrics	7
2	Forfar and Arneils Textbook of Paediatrics	1
3	British National Formulary	3
4	Ganong Textbook of Physiology	1
5	Robbin's basic Pathology	1
6	Biostatistics Textbook	1
7	West African College of Physicians Part 1 past examination questions	2
8	Essential Haematology	1
9	Laboratory Results	2

A breakdown of clinicians' use of these two most popular electronic and print sources is presented in Tables 14 and 15.

Table 14: Use of Medscape by the clinicians

Use of Medscape during the diary record week		
Participant	Rank	Days Used
1	Resident	6
2	Senior Registrar	0
3	Resident	0
4	Consultant	1
5	Resident	4
6	Resident	1
7	Resident	1

Table 15: Use of the Nelson's textbook of Paediatrics by the physicians

Use of Nelson's textbook of paediatrics during the diary recording week		
Participant	Rank	Days Used
1	Resident	1
2	Senior Registrar	0
3	Resident	0
4	Consultant	1
5	Resident	4
6	Resident	0
7	Resident	0

Participant 5, a resident, recorded consulting the Ganong textbook of physiology and Robbin's basic pathology as sources of medical information in pathology on a Tuesday in a personal reading. Personal reading as a method of obtaining information and increasing knowledge was a very common *independent learning* style among the clinicians reported from interview data.

In a **personal reading** in the hospital library participant 1 used some online sources such as *Medscape* and the *American journal of paediatrics*, indicating diversity in the form of information resources used for obtaining medical information. Other online journal sources

consulted restricted free access to only the journal abstracts. This limitation mirrors perspectives from the interviews that the clinicians' ability to access some electronic journals was frequently limited by access restrictions on many databases. These restrictions portend clinicians' recourse to personal subscription with the attendant cost affecting them negatively<sup>88</sup>. The use of the electronic journal medium by the clinician confirms the growing interest among the clinicians' in the use of electronic sources for obtaining medical information. This clinician's information activities align with the sub-theme of *independent learning* which was one of the means interview data showed the physicians use to increase their personal knowledge.

The use of these sources outside of paediatrics tend to support demands made by some clinicians during the interviews that the paediatric department library be stocked with a variety of resources because people's information needs were not limited to paediatrics alone.

The Sunday diary records of participant 6, a resident, indicate that the clinician engaged in preparation for a seminar presentation in Power Point format. Other sources of information used were slide share and USMLE questions portal, two electronic sources not mentioned by the interview participants. These new sources obtained from diary records are a probable indicator that the physicians had knowledge of a few more sources of information than they mentioned during the interviews. It could mean that people had updated their knowledge of sources in the period after the interviews which could be an indication of their willingness to acquire new information and knowledge.

Similar to the diary records of participant 5, this physician used an information textbook outside of paediatrics, further buttressing that the information needs of the physicians extended beyond general knowledge on paediatrics and their individual sub-specialties. The clinician experienced hiccups in connectivity to the internet at intervals during the information search, mirroring the general experience reported in other physicians' diaries and during the interviews.

The Tuesday diary record of participant 7, a resident, shows that the clinician consulted *e-Medicine*, an electronic medical evidence source, and other **journal sources** to obtain knowledge in support of decisions on the management of a patient with ventricular septal

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<sup>88</sup> Relates to question one for this study; what information experiences do paediatric physicians in Nigeria have? It shows access restriction to some online information resources is one of the negative information experiences of paediatricians in Nigeria.

defect in heart failure. This activity again evidences *point-of-care information access* for supporting patient care decisions and confirms that some physicians actually practiced this information activity for managing their patients, as was suggested during the interviews. One of the roles that some of the paediatricians felt information aids them to perform was *sensitising and counselling patients* about their health. The physicians' demonstrated performance of this role through bringing in the social welfare agency to subsidise the treatment cost for the patient with a heart failure illness.

Besides the use of *Medscape* and some other textbooks by participant 1 on a Monday, which in general, mirrors other diary records showing people's pervasive reliance on these sources, the participant also used the *HINARI* and *Lancet* electronic sources. *Lancet* was not mentioned during the interviews, thereby revealing a new aspect of resource awareness and use by this participant, while this was also the only mention of the use of *HINARI* in the entire diary records for all participants.

The interview data shows that the *HINARI* electronic database of medical information resources was freely accessible to all the physicians through the hospital's initiative, but only a handful of the paediatricians utilise the resource. This diary data about *HINARI* use corroborates its reported low level of use from the interview data by the paediatricians.

The poor usage of *HINARI* which is a freely available source of electronic journals for the clinicians, challenges the claims made by some interviewees, that the economic cost of personal subscription to electronic journals was a hindrance to their access and use of those resources. It could however, be argued in the contrary that there might be other reasons why people did not adequately use the *HINARI* given the extent of the use of *Medscape* another electronic source not freely available.

Sources of information used by participant 1, a resident clinician, on a Tuesday were the *AJOL (African Journals Online)*, *Medscape* and *Wikipedia*. The use of *AJOL* as an information source was not mentioned by participants during the interviews and other diaries, highlighting another electronic source in use by the clinicians. Clinicians did not mention the use of *Wikipedia* in other diary records. This points to a low dependence on *Wikipedia* as a medical information source and concurs with the interview findings that indicate a perception of lack of authoritativeness as reason for clinicians' aversion to its use for making clinical decisions. This mirrors *reliability and authenticity* being one of the influences indicated in the interview analysis on the clinicians' preference of information sources. This factor

suggests that some of the clinicians possessed a degree of ability to query and evaluate authenticity of information sources for application to patient care.

These clinicians information seeking practice corroborates the perception that alongside standard textbooks, the internet is increasingly becoming the most routinely used source of medical information by majority of the clinicians.

There was a widely-held perception among the clinicians that the hospital's internet service provision was not so efficient as to allow unimpeded, meaningful access to information as people require. The use of a personal tablet by the senior registrar for accessing resources on the internet takes cue from this perception of ineffective service provision by the hospital. Generally, clinicians resorted to providing self-internet connectivity mainly due to this perception of inefficiency. This factor tends to partly provide understanding of the *inhibitors to the physicians' information experiences and information practices for patient care*, which is the third specific objective of this study.

This factor of hospital internet service inefficiency supports the resentments of some clinicians expressed during the interviews, over the effects of the attendant cost of self-internet access provision, on their information seeking in support of patient care. This cost factor appeared exacerbated by the fluctuations frequently encountered by clinicians from slow connectivity. Participant 6, a resident, records on a Monday that he had this challenge of slow connectivity while using a personal internet service provision.

The increasing acceptance of electronic medical sources among the clinicians was underscored by the use of *PubMed, Medscape and Web MD* exclusively in the information search of a group of residents preparing for the West African College of Physicians (WAEP) examination, as reported by participant 5 on a Friday. The group's use of *Web MD* revealed another new information source that was not mentioned during the interviews which some of the clinicians were aware of and use for meeting their medical information needs. The new online resources identified through diary data is shown in figure 39.



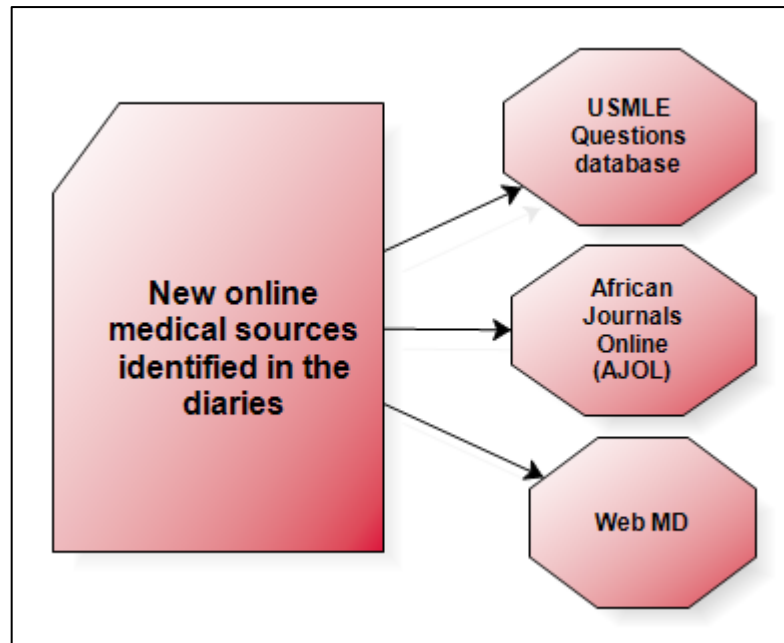


Figure 39: New online resources identified in diary data which some clinicians use

### 5.6 Theme five: Information literacy needs

Data analysis under this theme specifically contributes to answering the third research question for this study:

- Does the paediatricians’ information experience have implications for their information practices and patient care?

One of the sources a senior registrar used on a Thursday information search to meet his information need was accessing materials on the internet. However, no specific medical information source on the internet was mentioned by the clinician, generally reflecting the amorphous mention of ‘the Internet’ as an information source by most of the clinicians. The grouping by majority of clinicians, of all network-dependent access to medical resources as ‘the Internet’ lacks the differentiation necessary for identifying the specific resources consulted. Proper identification of specific Web-accessed information resources appears an information literacy need of the clinicians.

Participant 3’s mention of clinicians’ citation of various sources in their clinical seminar papers in a Wednesday diary record indicates the existence of some level of awareness that citations are a requirement in academic presentations. What remains uncertain however is; how well the paediatricians have overcome the general inadequacy of information literacy training from their respective medical schools through to post-qualification practice, as noted

during the interviews, to be able to appropriately reference the citations using the correct citation methods?

Reflecting this general low information literacy know-how among the clinicians, the Friday diary record of participant 2, a senior registrar, described the information shared by the unit consultant during team discussions, as evidence-based information. This perception could possibly be based on a strong learning culture of knowledge building tailored towards deference to seniority in rank and experience, existing among the clinicians during interpersonal information exchanges. Notwithstanding, the view does not fit with the standard understanding about sources of medical evidence which are explicit in form. This factor implies that some of the clinicians possessed a wrong perception about sources of evidence for practice that would require correction.

## **5.7 Conclusion**

In this chapter the interpretative analysis of the data from the diaries was also done under the themes generated for analysing the interview data. This allowed for comparing the findings from the two phases of data collection: semi-structured interviews, and diaries.

The next chapter - Chapter Six - presents the discussion of the findings from the entire analysis of the data done in Chapters Four and Five. The relationship of the findings to the literature review done in Chapter Two and other relevant new literature was shown in the discourse.

# Chapter Six

## Discussion

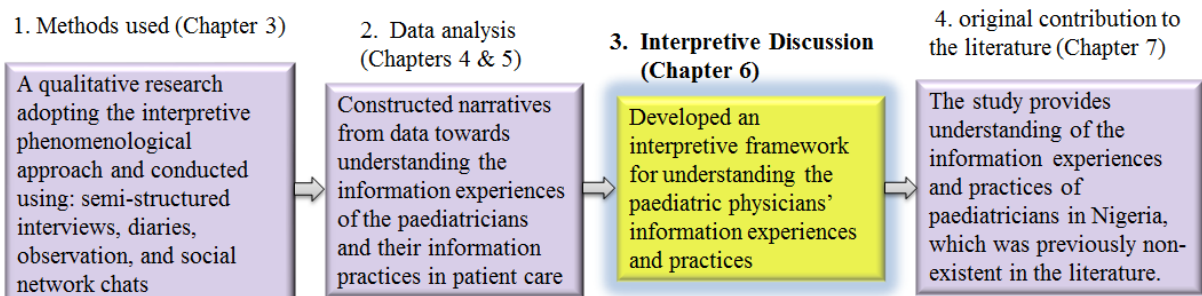


Figure 40: The interpretive discussion of findings

### 6.1 Introduction

This chapter discusses the findings of the research as presented in chapters four and five. The goals stated in box 3 of figure 40 were achieved through the discussion. The findings were discussed under the five themes of the study as follows:

- Theme one: Information experiences
- Theme two: Information needs
- Theme three: Information use
- Theme four: Information seeking behaviour
- Theme five: Information literacy needs

## Theme one: Information experiences

### 6.2 A model of the effects of information experiences on behaviour outcomes

In chapter two of this study, a synopsis of scholarly perspectives on people's information behaviour was done in order to obtain a holistic idea of the causative and outcome factors of that behaviour. A model which showed the causative and outcome factors of people's information behaviour and practices was developed from that synopsis of various perspectives and was elaborately discussed in the literature review.

A new model was developed from the findings of this study of paediatricians, and presented as an extension of current perspectives in people's information behaviour. The model is entitled '**the Knowledge production (Kpro) model** of the paediatricians' information behaviour' as shown in figure 41.

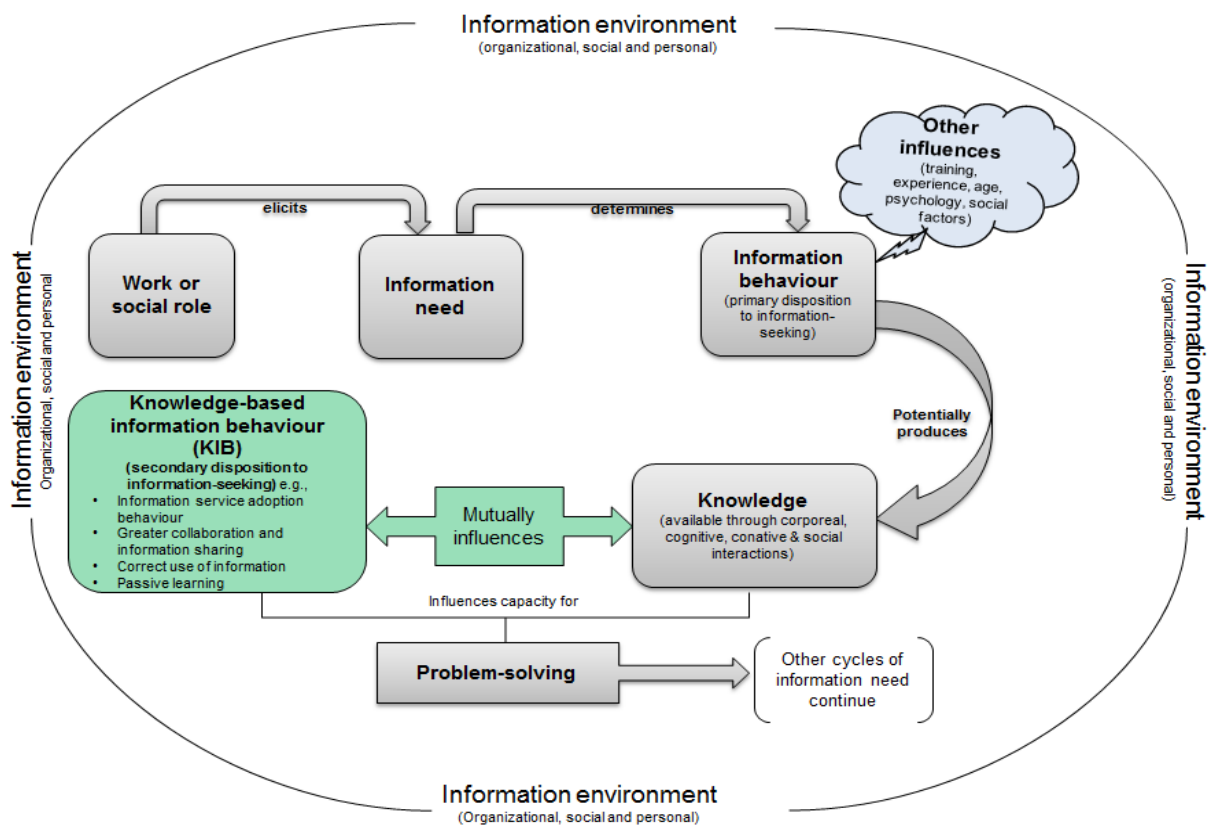


Figure 41: The Knowledge production (Kpro) model of the paediatricians' information behaviour

### **6.3 The Knowledge production (Kpro) model of the paediatricians' information behaviour**

The Kpro model explains how the paediatricians' information behaviour exhibited in the quest for satisfying their information needs produced knowledge and subsequent secondary information behaviour. The secondary information behaviour was exhibited by the paediatricians as a result of the knowledge they obtained from engaging in what was described as primary information behaviour. The knowledge acquired from activities that expressed the paediatricians' information behaviour, influenced their other information activities and responses to information needs within their information environment.

#### **6.3.1 The Paediatricians' information environment**

People's information needs are experienced within an information environment where their personal and social responsibilities are carried out in consistent everyday life. Lloyd (2010 a) regards this environment as a socio-cultural landscape of everyday life in which people interact with others in given communities. This information environment of people is akin to, albeit sub-pictorial, to what Wilson (1981) labelled as '*the user's life world*' (p. 6) which encompasses '*the totality of experiences centred upon the individual as an information user*' (p. 6). Wilson (1981) further explained that '*Within this life-world one important sub-world will be the world of work*' (p. 6). The purview of this study was to study the information experiences and practices of the paediatricians in the context of Wilson's (1981, p. 6) '*world of work*'. Also this world of work is presumed in this study to represent the paediatricians' social role of health care provision.

The paediatricians' information environment explained within the purview of this study; means their everyday life-world, in which they encounter people and resources that generate the totality of their professional information experiences. This environment consist of the organizational (e.g. hospital and its associated work role); social (e.g. their social spheres of learning influenced by homophily); and, personal (e.g. their career progression and other professional needs).

Within this information environment, the paediatricians experience the need for information in aid of executing their professional work roles as healthcare providers to paediatric patients. The knowledge production model developed in this study for explaining the paediatricians' information behaviour, therefore, positions work or social role as the start point that elicits other chain of outcomes in the physicians' information behaviour, in line with its finding.

### 6.3.2 Relationship between information need and information behaviour

The Kpro model shows that the findings of this study conform to other information behaviour perspectives that inferred information needs as the causative factor of people's information behaviour. The paediatricians need for medical information prompted their informational activities towards meeting those needs. This factor also aligns with the prevalent perspective that people's work and/or social role was the primary initiator of their information needs. In this study, the paediatricians' reactions when they encountered such information needs were to search through or inquire from sources that were perceived as relevant for providing the information needed.

These information activities such as consulting with colleagues otherwise called '*information exchange*' (Wilson, 1981, p. 4), reading textbooks, searching through the internet etc., were conceptualized in the literature as representative of information behaviour. The paediatricians' display of this behaviour was however, their primary, almost impulsive, reaction to those professional-role engendered information needs. This study labels this primary information behaviour as first-level actions towards information-seeking. These primary actions were mostly devoid of value judgments about the merits or demerits of sources, as the paediatricians' were: i) more concerned with easing the pressure of their information needs; and, ii) not fully conversant with the qualities and values of the information resources at that first point of use.

This research discovered that the paediatricians' information behaviour elicited the knowledge which in turn produced a new form of information behaviour and practice, described in this new Kpro model as a **secondary disposition** to information seeking. The paediatricians' use of information sources in the quest to solve their information needs at the primary level of information behaviour engendered a value-assessment-based use of the sources in further information need situations. Majority of other information behaviour perspectives were silent on this evaluative disposition which was the product of the individual's encounter with information sources.

### 6.3.3 The knowledge obtained from the paediatricians' information behaviour

The paediatricians' primary disposition to information-seeking to solve their information needs at the primary stage of behaviour provided them with knowledge which was obtained from various information affordances: corporeal, cognitive, conative and social interactions.

The type of knowledge which the clinicians obtained from expressing this primary information behaviour were: i) an increase in their professional knowledge; ii) conversance with the merits and demerits of information resources and services; and, iii) knowing how information is negotiated, communicated and used within their community of practice. While the first two aspects of knowledge were obtained from a combination of people and documentary sources respectively, the last aspect was, almost exclusively, obtained from interactions and information exchanges among colleagues.

For example, paediatricians obtained information that increased their knowledge and aided the avoidance of the errors that resulted to fatalities, through participation in the weekly death reviews. These interpersonal and/or inter-group exchanges provided opportunity for the negotiation of: meaning of concepts; new practice modalities; and, challenges and prospects in patient care. These interactions afforded clinicians' new knowledge from the collegiate information sharing.

Lloyd (2010a, 2010b) and Cole (2011) proposed the perspectives that recognized this dynamism of information behaviour in extending to knowledge production, although they equally failed to clearly specify what the knowledge consisted of. Cole (2011) discussing from an information retrieval system (IR) perspective proposed that "*an information science or user-oriented theory of information need envisages a knowledge formulation/acquisition system*" (p. 1216). It surprises therefore, that this author also did not place the knowledge to be acquired by the user in any specific context.

Previous studies were silent on this vital outcome of people's information behaviour. Perspectives that followed Wilson (1981) to canvass information use as the direct consequence of information behaviour include Wilson (2000, p. 53); Spink and Cole (2006). Spink and Cole (2006, p. 25) aver specifically that "*for millennia humans have sought, organized, and used information as they learned and evolved patterns of human information behaviors to resolve their human problems and survive*". The authors further produced a model which contextualizes information behaviour as consisting of '*seeking, searching, and use*' (p. 29). These perspectives which connected information use directly with information behaviour, neglected the centrality of the knowledge generated from that behaviour, as the basis for effective information use and/or for eliciting further information behaviour.

This study proposes that the paediatricians' other information practices were predicated on the knowledge obtained from their primary information behaviour. This knowledge influenced their assessment of the value of information services and resources, available for use in solving subsequent information problems. The characteristics of the secondary information behaviour expressed by the paediatricians are further discussed below as knowledge-based information behaviour.

### 6.3.4 Knowledge-based information behaviour

The paediatricians' primary information behaviour as exemplified by the sources of information which they utilised in solving their information needs, initiated a judgement-of-value-based further use of those sources, which include; people, electronic and documentary. This judgement-of-value disposition was predicated on the knowledge generated by paediatricians' interactions with these various information sources. This new knowledge influenced: paediatricians' perspectives about the value, usefulness and usability of the various sources for pursuing further information needs; their ability to acquire information in other passive encounters; and, their ability to correctly use obtained information. The components of this knowledge-producing concept in the paediatricians' information behaviour are shown in figure 42.

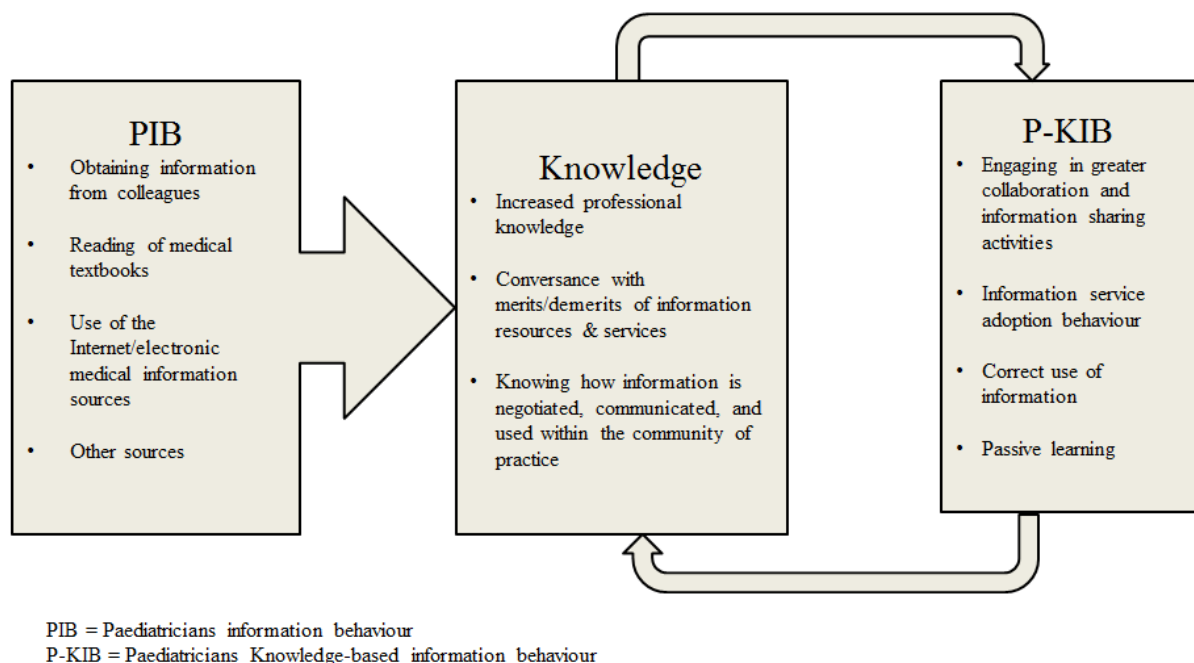


Figure 42: Knowledge obtained through the paediatricians' information behaviour and further KIB

The paediatricians' knowledge consequently had effect on their disposition and capability in the use of those information sources whether human or documentary, when pursuing further



information needs: predominately in patient care and personal development. This factor of **knowledge-based information behaviour (KIB)** was captured in the green box of the Kpro model of the paediatricians' information behaviour.

This behaviour was demonstrated for example, in the paediatricians' rare use of most of the information services provided at the hospital. This development was attributed to the underwhelming experiences the clinicians associated with the existing service in terms of meeting both their information needs and other expectations such as quality of service. The paediatricians' KIB in this regard was therefore, premised on those negative experiences garnered from previous encounters with the information services and resources provided at the hospital.

Positively, the paediatricians' displayed a high disposition to the use of interpersonal and collaborative methods of information sharing for obtaining medical information. This disposition was a knowledge-based information behaviour premised on perceptions of human sources of information, particularly immediate colleagues, as being both useful and easily accessible. The paediatricians' endeavoured to maximise this aspect of information gathering by engaging in diverse collaborative and collegiate information sharing activities at the hospital and when attending external conferences.

The knowledge-based information behaviour displayed by the paediatricians' represents a reactive disposition which emanated from their perceptions about the value of those information sources, in meeting their information needs. The various aspects of this reactive information behaviour disposition are as explained in greater details in the subheadings below.

#### **6.3.4.1 Greater collaboration and information sharing**

Apart from minor cases of some clinicians' negative orientation towards inter-personal information exchanges, majority of interviewees acceded that they obtained useful medical information more markedly, when discussing with colleagues at group chats. This practice led to increase in people's knowledge, and therefore, fostered greater willingness for more collaborations and information sharing.

The paediatricians practiced this strong knowledge-based culture of information sharing and collaboration through various interpersonal and group activities. Group studies, team discussions and clinical seminars were predominant in this oral information gathering method

among the paediatricians. This information behaviour was reflective of Reddy and Jansen's (2008) concept of collaborative information behaviour (CIB) as opposed to individual information behaviour (IIB). Reddy and Jansen (2008) suggest that in the medical field, collaborative information behaviour could be utilized by team members who understand the needs of their clinical unit in collaborating to provide '*a "just-in-time" fashion (not too soon and not too late)*' (p. 258) information for their teams.

Furthermore, the clinicians shared information interpersonally as they worked routinely in the clinics every time. These information exchanges were done majorly through face-to-face discussions or by phone call discussions and at various meeting spaces in the hospital including the seminar room, the doctors' lounge, the library, and the ward call rooms. The clinicians claimed that the information which they gathered through this method contributed to ameliorating the information difficulties they experienced, particularly the dearth of resources, alluded to by every interviewee.

#### **6.3.4.2 Information service adoption behaviour (ISAB)**

The paediatricians' overarching perspective of the hospital information services as dysfunctional and ineffective resulted in their avoiding its use for meeting their information needs, in preference of other sources – people (pervasively), print and digital. Although a general practice of self-help in information provision predominated among the clinicians, it entailed personal financial costs, which in majority of cases were exorbitant. This factor was perceived by majority of the paediatricians as an obstacle to their obtaining the medical information they needed for effective patient care and increase in personal knowledge.

This new disposition to rejecting the dysfunctional information services of the hospital was labelled in the Kpro model of the paediatricians' information behaviour as **information service adoption behaviour (ISAB)**.

An intriguing outcome of this behaviour was that the clinicians felt constrained to fill the gaps created by their negative experiences with inadequate information services at the hospital by opting to self-provide their needed medical information resources. This practice was amplified by the paediatricians' perception that information use played an integral, indispensable, role in ensuring effective clinical practice. The rare use of the hospital information services, in spite of this perception of usefulness of information and the personal cost of self-help to the paediatricians, therefore, indicates there was service rejection

behaviour. This anomalous state in clinicians' information experience at the hospital requires being resolved, by the provision of suitable and effective hospital information services, to ensure that effective paediatric care is rendered to patients.

#### **6.3.3.3 Correct use of information**

A very important knowledge-based information behaviour exhibited by the paediatricians was the ability to locate and use information correctly in a more confident manner. This ability was particularly useful when handling rare and challenging cases. For example, a consultant acceded that, rare cases tested both skill and knowledge of clinicians and that their ability to overcome that challenge hinged on using "*credible information to support [their] decisions in such cases*"<sup>89</sup>. The credibility and correct use of the information obtained in those instances was established based the knowledge the clinicians possessed.

#### **6.3.4.4 Passive learning**

Knowledge-based information behaviour was further displayed by the paediatricians through passive information gathering, including at informal encounters, majority of which were interpersonal or group interactions. The paediatricians were able to gather information that added to their knowledge, not necessarily from a conscious pursuit of new information all the time. For example, many interviewees admitted obtaining useful medical information at times from casual conversations in social meeting spaces such as the doctor's lounge, although they did not purposely set out initially to pursue an information need.

Passive learning as knowledge-based information behaviour was similarly evident in the admission of interviewees' that some of the new discoveries and knowledge which they obtained during patient care, were either predicated on residual knowledge from information sources which they had used in the past, or from having handled similar cases previously, i.e. knowledge gained through practice.

The paediatricians' general everyday preferences in gathering information towards meeting their professional information needs and its other associated causative factors are discussed further in the section 6.5.

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<sup>89</sup> Interview 14, consultant, male

## 6.4 Comparing the Kpro model with previous information behaviour perspectives

As shown in figure 43, several authors, for example, Wilson (1997; 1999); Sonnewald and Livonen (1999); Li and Belkin (2010); Lloyd (2010 a); Nui and Hemminger (2012) ascribed the starting point in people’s information behavior to the influences exerted by the roles they play in everyday life in the society and the workplace. Those work or social roles carried out by people in their societies was assumed to precipitate a need for information to support decision making for the effective discharge of those roles.

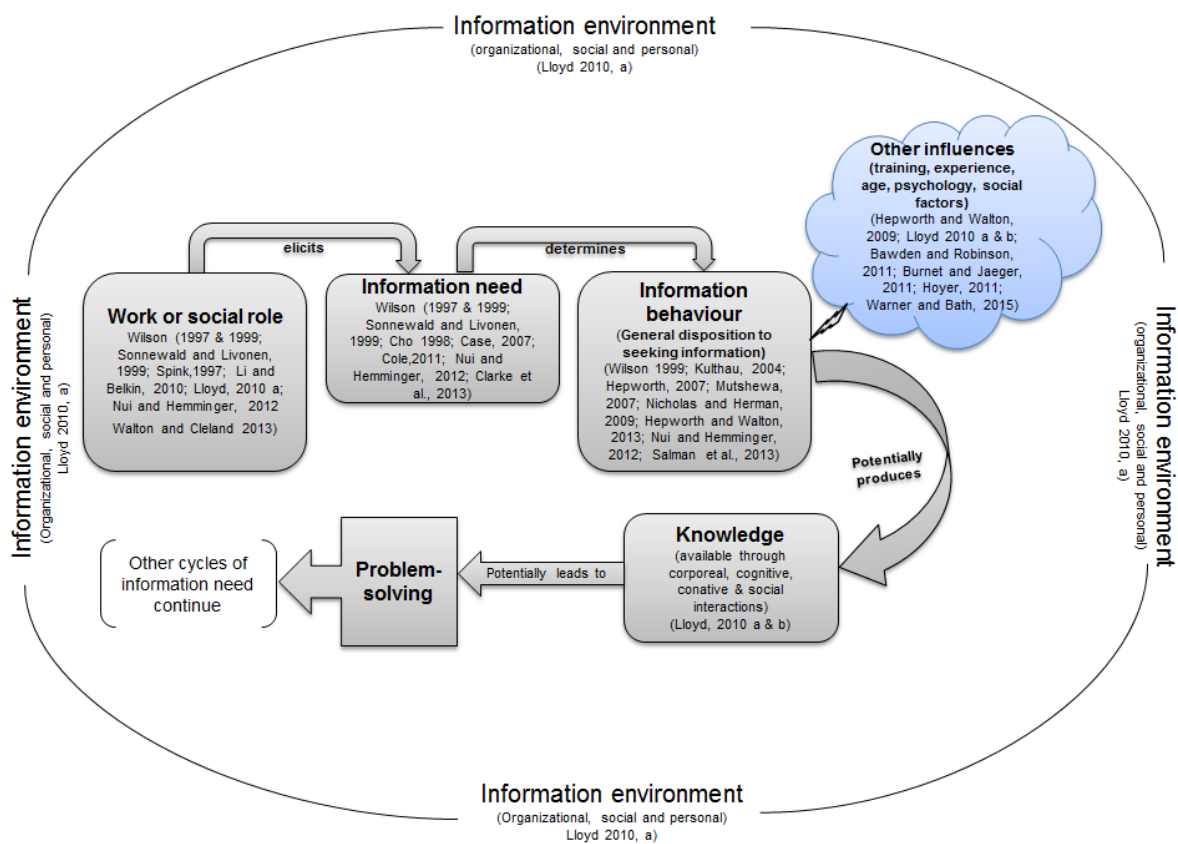


Figure 43: A model of scholarly perspectives on people’s information behaviour

The majority of authors inferred that finding answers to information need was exigent for individuals due to the pressure exerted by their work and social roles. People’s information behaviour was reflected in the information sources which they utilized for finding answers to those information needs. Wilson (1999) specifically described information behavior as *‘those activities a person may engage in when identifying his or her own needs for information, searching for such information in any way, and using or transferring that information’* (as cited by Detlor, 2003, p. 114).

The findings of this study about the paediatricians' information behaviour align with the perspective that the need for information was precipitated mainly by people's work roles. The information need occurred routinely in circumstances where the clinicians required support for decisions aimed at achieving greater effectiveness in patient care or increasing personal knowledge. The clinicians reacted to those professional-role information needs which arose either for clinical, examination, seminar or personal knowledge purposes, by approaching sources which they considered as capable of providing the information they needed.

The most prevalent medium through which the clinicians gathered information relevant in their professional activities was from their colleagues. Obtaining information in this way was pervasive because the daily clinical practice afforded clinicians the opportunity of routine interactions which enabled people to share knowledge. This was followed by the reading of personal textbooks as the textual information source of general preference among the clinicians. Obtaining information from electronic medical sources through the internet was also increasingly popular among the majority of the clinicians. These information gathering techniques represented the paediatricians' information behaviour, primarily.

Some authors such as Case (2007); Nicholas and Herman (2009) also aver that work and social roles precipitate people's need for information, but disagreed with the perception that people were obligated to seeking answers to those needs. Case (2007) argued matter-of-factly that "*informed behavior does not always result from exposure to information*" and therefore, individuals have no obligation "*to think, feel, or do something about it [i.e. the information they are exposed to or the information need they have]*" (pp. 98-99).

This argument by Case (2007) queried the perspective that people's information need prevailed on them to search for information in display of information behaviour, as postulated in much information behaviour literature. Authors such as: Wilson (1997; 1999); Kulthau (2004); Hepworth (2007); Mutshewa (2007); Niu and Hemminger (2012); and Salman et al. (2013) have proffered that information need existed when there was a gap in people's knowledge noticed prior to or during the process of a role performance. This need for information causes people to engage in various types of information-seeking activity in order to obtain the information to resolve it. The information source preferences of an information seeker, in the process of obtaining the information to solve the information needs as they occur, were what the authors described as the information seeker's information behaviour.

This gap in people's knowledge which was deemed to trigger information need was referred to by various terminologies in the literature; for example Anomalous States of Knowledge (Belkin, 1980; Belkin et al., 1982). Nonetheless, authors generally fell short in providing a specific explanation of what the gap in knowledge consisted of. Part of the problem however, was the long-standing inter-definition of the concept of knowledge with 'information' and 'data' which persistently obfuscated the meaning and application of the various concepts in information behaviour discourse. Although it was preponderantly inferred that the knowledge gap occurred in the process of the performance of individual roles, especially in problem-solving contexts (Wilson, 1981; Li and Belkin, 2010; Lloyd 2010 a; Niu and Hemminger, 2012), what specifically constituted the knowledge acquired and applied by the information-seeker, through the information seeking behaviour, was not given enough attention.

Nicholas and Herman (2009) advanced a perspective that was slightly different with Case (2007), but with similar contrast to the mainstream perspective of the authors in information behaviour discourse. Nicholas and Herman (2009) inferred that there was tendency for the avoidance of information-seeking to manifest in people's information behaviour, despite their information needs. They aver that this tendency was more likely to occur in or to be heightened by certain circumstances. For example, the authors believed that people could be overwhelmed by the magnitude of the information produced "*...in today's internet-based information world [to propel one into] taking a conscious decision not to attempt to meet one's information needs, at least not fully...*" (p. 19). This implies that although people may feel the need for information, but when access platforms such as information technology, e.g. use of the internet, becomes part of the process of obtaining that information, it could affect people's willingness to further pursue answers to those needs.

These divergent perspectives of Case (2007) and Nicholas and Herman (2009) were nonetheless, not popular and mainstream. These authors' views were therefore, overshadowed in the literature by others canvassing people's inclination to embarking on actions required for, or that could lead to solving their information needs. The information-generating actions people took during those information-need moments (i.e. sources utilised for obtaining information), were predominately construed as their information behaviour.

The information behaviour attributes of the clinicians who participated in this study did not align with the views canvassed by Nicholas and Herman (2009) who inferred that the glut of information in today's world as potentiated by technology (the Internet specifically), could

lead people to deliberate avoidance of information-seeking. The fact was that the clinicians recognised their limited proficiencies in the use of information technology. They also understood the navigational challenges associated with the information glut which the Internet medium had precipitated. They nonetheless, had the inclination to using modern technological devices, electronic medical resources, and the Internet for their information gathering. The clinicians developed this information behaviour majorly through experiences in practice, which had exposed them to the merits and values of the technological medium for obtaining quick access to medical information.

This finding disproves Nicholas and Herman's (2009) view that people would refrain from the use of the Internet in pursuing answers to their information needs due to individual perceptions of the possession of inadequate know-how in its use. This research has shown that, the use of the Internet for obtaining medical information was not obviated by the clinicians' considerations of their individual know-how. Instead of displaying such avoidance behaviour, the attractive advantages of the Internet drew the clinicians to adopting its use increasingly. This behaviour included people opting to self-sponsor learning opportunities and asking colleagues to coach them in order to become proficient internet users. For example interviewee 8, a male resident, said; "*Last year [referring to 2014] someone taught me how to use google scholar...*" That encounter reveals this clinician's readiness to learn that aspect of internet use through a colleague's tutorial, in order to become a more proficient internet user.

This receptiveness of the paediatricians to the use of the Internet deviated from the normal expectation and surprised, because of the general low level of technology adoption and use in the developing world setting where they practiced.

The clinicians amply demonstrated their belief in the advantages of technology given that the majority of interviewees acceded to having imbibed the use of the internet and other electronic media for accessing medical information. The clinicians did this at varying degrees of individual proficiency and effectiveness, nonetheless. The concern expressed by majority of clinicians was rather about how they could become more proficient and effective users of the technological sources for obtaining medical information.

Another grey area in current thinking which this study highlights is that much of the information behaviour literature portrayed information use in decision making and problem-solving as the outcomes of people's information behaviour. For example, Wilson (1981, p. 4)

which is the seminal paper on user studies canvassed this notion. The findings of this study of paediatricians align with the prevalent notion that people's information behaviour and information use could ultimately result in problem-solving within the context in which information was needed. However, this problem-solving potential was only enabled in cases where the correct information was accessed and rightly applied.

This study found the literature falls short in placing adequate emphasis on how information use (which was the concomitant result of people's information behaviour) was based on another intervening factor; the knowledge people obtained through their information behaviour.

This study argues that there is a definable knowledge which the paediatricians developed as a consequence of their information behaviour as expressed within their information environment. This information environment shaped their information experiences and practices, and from those experiences and practices they constantly obtained and refined a knowledge base.

The aspects in which the paediatricians gained knowledge through their information behaviour were identified as: i) increased professional knowledge; ii) conversance with the merits/demerits of information sources/services; and, iii) knowing how information is negotiated, communicated and used within their community of practice. This knowledge base undergirded their other information actions, including their ability to correctly use information for problem-solving. The clinicians information use was therefore, not independent of the knowledge they obtained by expressing their information behaviour within their information environment.

Beginning with Wilson's (1981) seminal paper titled "*On user studies and information needs*", others such as Wilson (1997; 1999); Cole (2011) and Niu and Hemminger (2012) emphasized the concept of information use for problem-solving as the ultimate aim of people's information behaviour or information-seeking behaviour. Surprisingly, the knowledge which undergirded people's information use was not emphasized in these studies. These perspectives in the literature also failed to highlight the relationship between the knowledge people obtained through their information behaviour and their further information practices and information use in everyday life, particularly in workplace contexts.



The two scholars that tended to canvass the transition to knowledge from information behaviour were Lloyd (2010a) and Cole (2011). Lloyd (2010a) recognized that individuals attain knowledge and become information literate as they participate within the spectrum of information behaviour activities in a socio-cultural environment. This perspective did not gain prominence in the literature as it was crowded out by proponents of the information behaviour leads to information use perspective.

This non-emphasis on attained knowledge is a nebulous position of current information behaviour discourse. This study developed the Kpro model of the paediatricians' information behaviour as an extension of the current thinking in information behaviour discourse. Following the description of an information behaviour model as intended to provide: *'a framework for thinking about a problem... statements, often in the form of diagrams that attempt to describe an information-seeking activity, or the relationships among stages in information-seeking behaviour'* (Wilson 1999, p. 250); the Kpro model graphically explains the motivations and outcomes of the paediatricians' information practices.

The Kpro model shows and explains what the knowledge developed from the paediatricians' information behaviour consists of. It further explains how this knowledge consequently produced a different type of information behaviour exhibited by the paediatricians – knowledge-based information behaviour. The components of this knowledge-based information behaviour: information service adoption behaviour; collaboration and information sharing; and, passive learning, were also explained.

Kpro model emphasized that these were vital outcomes of the paediatricians' information behaviour. These information behaviour outcomes were not reported in other information behaviour literature as shown in figure 43. Although those information behaviour studies were conducted in many diverse contexts and participants, those that were similar to this study of clinicians surprisingly also missed the point.

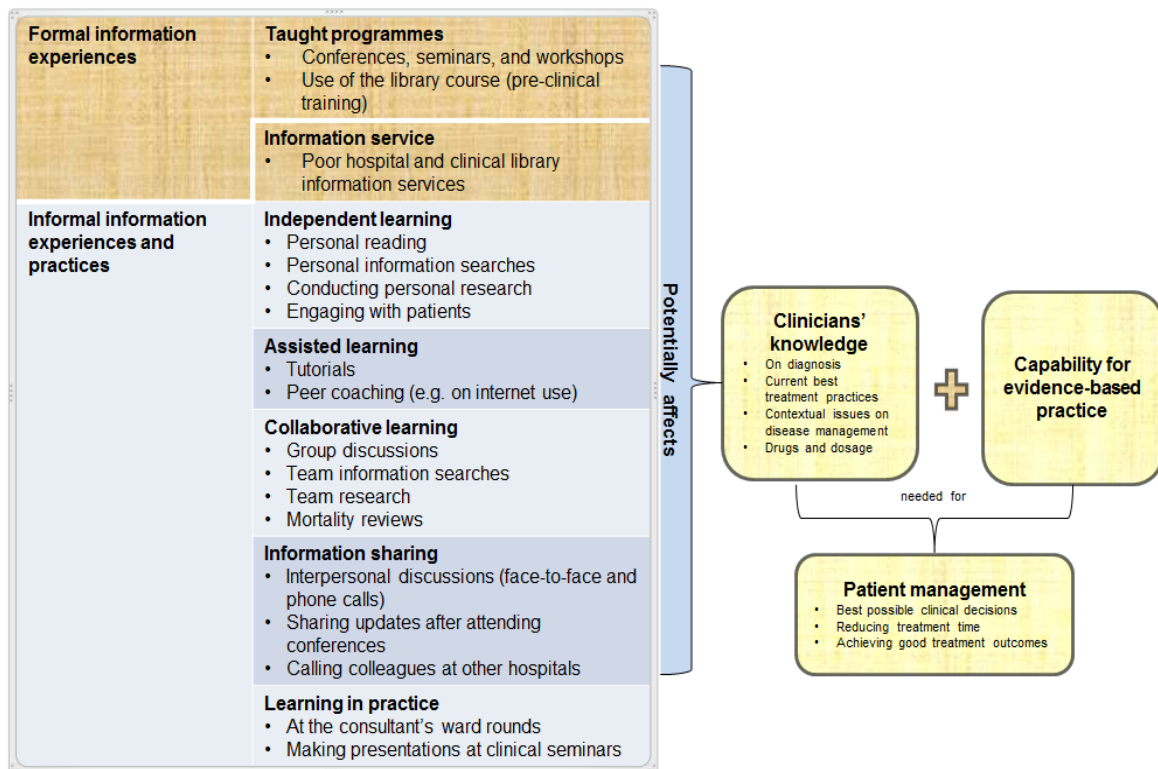
The perspective on the attainment of discernible knowledge from information behaviour, and the resultant knowledge-based information behaviour, were the main contributions of the Kpro model to existing literature on people's information behaviour.

## **6.5 The predominance of informal learning and oral information activities**

The majority of the paediatricians had little to no formal information literacy training at their medical schools either pre-clinical or at the clinical post-qualification stage towards

developing capacity for an evidence-based practice. Similarly, limited post-qualification training meant the clinicians were only afforded information gathering from Conferences, Seminars and Workshops, plus the inadequate services of the hospital library as their sources of formal information gathering (see figure 44). The study however, found that the paediatricians perceived the hospital's information services as grossly ineffectual in meeting their information needs. There was no allure for them to use these information services due to the negative perceptions of unsuitability to their information needs resulting in a general low use of the services.

Additionally, this study revealed that the current information experiences of paediatricians do not support the development of information literacy capability that enables best possible medical information use, and evidence-based practice. The major impediment the paediatricians encountered in exercising other good information practices for patient care beyond gathering information from colleagues was the scant information literacy training they received during professional schooling. This factor generally engendered poor information skills for the clinicians. This finding indicates the imperative for information literacy training interventions for paediatricians in Nigeria towards developing their capabilities in the appropriate use of evidence for patient care.



**Figure 44: The Paediatricians' information experiences and practices showing predominance of informal methods**

Figure 44 indicates that the clinicians were inclined to a heavy reliance on colleagues for obtaining information which they applied to patient care and for personal knowledge. This scenario owed in the main part to the perceived poor and dysfunctional information services and resources provided by the hospital librarians and the clinicians' lack of adequate training on medical information access and use. This paucity of information literacy training for the clinicians about different ways to find and use medical information sources was experienced by majority of clinicians at the medical schools.

The clinicians' tendency towards reliance on information from colleagues in their information activities for taking patient care decisions and personal development could be attributable to these influences. Aside from people which predominate as the routine information source, the next most popular information source used by the clinicians was textbooks. Textbooks were preferred by the paediatricians as the main source of medical evidence. The popularity in the use of textbooks also owed to other factors such as the non-complicated nature of its use, requiring little to no training, its easy availability for personal purchase, besides the clinicians' perception that the information it contained was the most reliable for making patient care decisions. How strong this preference was among the paediatricians was perceptible in the

statement that “*when you are torn between two views the safest option is to revert to your book which contains information that has been proven over time*”<sup>90</sup>

Studies by Dawes and Sampson (2003); Kosteniuk et al. (2013) similarly revealed clinicians preference for textbooks for obtaining medical information in patient care. The disadvantage associated with using information obtained from medical textbooks for patient care is that ‘*the information contained in them is often obsolete*’ (Onady and Raslich, 2004, p. 358) due to the long time it takes to review textbooks. This has the implication that clinicians’ reliance on textbooks as source of evidence could expose patients to the risk of using obsolete information for making decisions about their health.

This study found that in general, the paediatricians lacked adequate preparatory training on the use of information in medical practice. Other studies have found that adequately preparing clinician trainees for versatility in finding and utilizing electronic and print medical information is foundational to effective evidence-based medical practice (Brown and Nelson, 2003; Rosenberg et al., 1998; Burrows et al., 1989; Maggio et al., 2013; Coomarasamy and Khan, 2004). The medical information access and utilization capability inadequacy precipitated by the absence of preparatory evidence-based medicine (EBM) trainings at the clinicians’ respective medical schools and during clinical practice, makes EBM training interventions imperative.

The integration of EBM courses to the medical school curriculum is increasingly being adopted for the training of future medical doctors. The reports cited above indicating increased implementation of EBM courses in medical schools are however, more from high-income, industrialized countries. This trend contrasts with the information literacy experiences of the paediatric physicians in Nigeria, although the aim of healthcare delivery is basically the same in all parts of the world – to deliver effective care to patients. In spite of this head start, Kawamoto et al. (2005) reported several researches which indicated that “*the health care delivered in industrialised nations often falls short of optimal evidence based care*” (p. 1). It, therefore, surmises that, evidence based medicine training and its optimal practice in clinical care, is acute need for the paediatricians in this study.

The information literacy courses which the paediatricians’ in this study were given while in training were limited to single courses in library use, and in more detrimental cases were

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<sup>90</sup> Interview 6, female, resident

embedded in broader courses. One case that buttresses the contrast of this paucity with the case of the industrialised countries is, for example, Maggio and Posley (2011, p. 259) who revealed librarian-medical doctor collaboration on curriculum development and teaching of information literacy to medical students at the Stanford University School of Medicine. This programme was reported by these authors to have led to an increase in the medical students' capabilities in evidence based medicine. In other similar studies, Shih (2012); McClurg et al. (2015); and MacEachern et al. (2012) posit that such collaborative effort in medical schools proved necessary for a successful information literacy education to medical students that adequately prepared them for the use of evidence in practice.

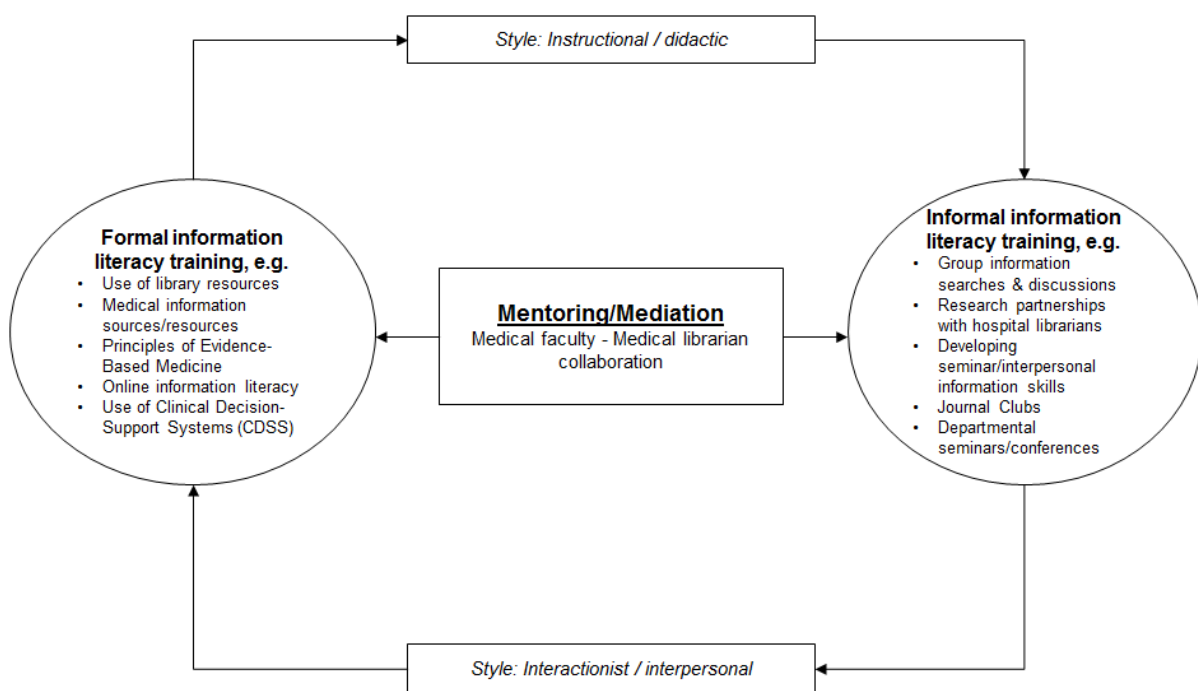
Other studies have also correlated improvements in trainee medical students' EBM capabilities to the delivery of EBM courses. A study by Lai and Nalliah (2010) demonstrated medical students responsive information behaviour changes to the inclusion of EBM training during the period of their medical course in Malaysia. Students in their study switched from dependence on textbooks and printed concise references to the use of electronic sources following the EBM training thereby demonstrating knowledge about the up to datedness of electronic sources. Similarly, Gruppen et al. (2005) found that even brief stand-alone training can improve medical students EBM search capabilities in subsequent information searches.

This finding about the paucity of information literacy training for the paediatricians at professional training in Nigeria does not surprise, given the notion of the "*struggle for information and knowledge*" in Africa as was posited by Sturges and Neil (1998, pp. 1-2). Also, this negative situation is more likely than not, to be the case Nigeria, following Tiamiyu and Aina's (2008, p. 3) submission that countries in the sub-Saharan region have made very little progress in science and technology, human capital development and the use of digital information infrastructure; a situation persisting up to this 21<sup>st</sup> Century.

The concern raised by this negative scenario is that when people are sick and visit the hospital, their expectations would normally be oblivious of system and personnel problems, due to the value they place on their health. Patients everywhere would normally hope to obtain good outcomes from their treatment by clinicians. In this study's context, the paediatricians endeavour to cope with this expectation in spite of their lack of adequate information literacy preparation. Clarke et al. (2013) have, however, explained that this lack of information literacy is detrimental to a physician's ability for taking the best possible decisions that enables the achievement of best possible outcomes in patient care.

This negative scenario and the advantages of having an information literacy training in place during the professional medical training as reported in Gruppen et al. (2005); Lai and Nalliah (2010); Maggio and Posley (2011); MacEachern et al. (2012); Shih (2012); and, McClurg et al. (2015) makes the inclusion of information literacy in the professional schooling of paediatricians in Nigeria imperative.

The present unavailability of uniform and specific information literacy courses in the training of paediatricians in Nigeria has created the imperative for urgent intervention to be made. This study, therefore, proposes the model shown in figure 45, as a framework that could be used for initiating such information literacy training of paediatric residents in Nigeria.



**Figure 45: An information literacy skills training (ILST) model for paediatricians in Nigeria**

The ILST framework proposes the integration of the formal and informal learning styles for the inculcation of information literacy in paediatricians undergoing the residency programme. Introducing this capacity development at the residency level is necessary following the opinion of Dulmen and Holl (2000, p. 489) that *'it is debatable whether after residency; paediatric education can influence paediatrician performance'*.

The framework proposes the adoption of the formal and informal learning styles in the inculcation of information literacy capabilities to the paediatricians during residency training, using the didactic and interpersonal methods respectively. This appears plausible given that the study revealed inclination among the paediatricians to utilising the formal and informal

methods for obtaining medical information, albeit, with predominance of the informal as shown earlier in figure 44.

In view of the finding that there was general lack of formal information literacy training at the paediatricians' respective medical schools, which proved detrimental to their developing information capabilities formally, the framework proposes formal information literacy courses to address this disadvantage. The courses proposed for inclusion in the information literacy training during paediatric residency include: a) use of library resources; b) medical information sources/resources; c) principles of evidence-based medicine; d) online information literacy; and, e) use of clinical decision support systems.

This proposal envisages that these courses would be useful in solving the paediatricians' "*struggle for information and knowledge*" Sturges and Neil (1998, pp. 1-2) precipitated by inadequate information literacy preparation at the medical schools.

Within this information capacity development framework, the need to introduce online information literacy training for the paediatricians in the use of Web 2.0 tools in their medical practice should be given due consideration. This is because the '*ability to formulate a clinical question, search for best evidence, critically appraise and apply evidence remains an essential skill for clinicians delivering evidence-based healthcare*' towards enhancing its effectiveness (Cullen et al., 2011, p. 120). This imperative undergirds the suggestion for the inclusion of the courses on the principles of evidence-based medicine, online information literacy, and the use of clinical decision support systems, which are non-available in paediatric training in Nigeria at present.

This is very cogent considering the resident paediatricians' admission that they depend on colleagues for information when challenges arose while handling critical incidents. This practice of the residents is undoubtedly unsafe for patients, owing to the possibility that the residents could obtain and use anecdotal information from their colleagues. This possibility poses threat to obtaining desirable outcomes in patient care and in extreme cases, may result in fatality, even if the misleading information was supplied inadvertently.

Another reason why the introduction of information literacy training using this proposed model is important is that the study discovered existence of a negative perception by patients/parents about clinicians who practiced point of care information access. The clinicians' discomfort with this labelling hindered some from its frequent use. The training

would assist the clinicians' develop ability for creating balance between patient expectations and appropriate care, in relation to evidence use at the point of care. It is envisaged that developing the clinicians' interpersonal information capabilities would eliminate this barrier to a good information practice in clinical care.

A follow up to the provision of appropriate training in finding and using medical evidence would be the provision of an information service that facilitates the utilisation of evidence sources in actual practice. The participants of this study agreed that certain services such as the central and departmental medical libraries with internet access, hospital librarians, and free access to the HINARI database, internal conferences, and occasional sponsorship to external conferences were available for enabling their access medical information. Although the clinicians considered these services as necessary, the majority complained that the services were poor, inadequate, unsuitable, dysfunctional in most cases, and generally unreliable.

This paucity of information service provision experience of the clinicians' hardly meets the requirements needed for an effective evidence-based practice. Their experiences precipitated a reliance on informal information seeking methods, mostly from oral sources, that do not adequately support evidence use in patient care. The negativity associated with this scenario is highlighted by the studies of Percheski and Hargiatti (2011); Rice (2006); Grossman and Zerilli (2013); and, D'Alessandro et al. (2004) indicating that the provision of adequate evidence-based information for clinicians to rely on for their clinical decisions increases the probability that desirable treatment outcomes will be achieved during patient care.

Interviewees alleged that one of the negative experiences they encountered was the existence of poor information services by the hospital librarians together with the absence of clinical librarians to offer embedded information service. Notwithstanding this factor, the role of clinical medical librarians in making medical evidence not only available and accessible, but also usable by clinicians in providing patient care has been espoused in scholarly research such as Scherrer and Dorsh (1999); King (1987); Harrison et al. (2013); and, Marshal (2014).

However, to be effective in rendering such information services Scherrer and Dorsh (1999) advocated the necessity for clinical librarians to locate the right sources and assess the content effectively for eliciting useful medical information from them. The authors further inferred the need for the medical librarian '*to engage in a concerted effort to accept new roles and acquire new skills*' in order to perform this onerous function effectively (p. 324). The hospital



librarians' acceptance of role changes and re-training appears to be necessary in this study's case, in order to engender improvements to their present information service delivery to clinicians. Given the paediatricians' overt negative perceptions of the hospital librarians' services at present, this action tends to be required for re-orientating them towards reconsidering those information services as possessing any useful informative value for patient care and personal knowledge.

Given also that in clinical practice, the physicians' information capabilities developed mainly through informal, inter-personal information sharing and self-learning, the framework proposes that this could be mediated. The information literacy training mediation proposed for the paediatric residency is to be carried out by the medical faculty, e.g. the consultants, and the medical librarians (inclusive of their other nomenclature such as; health librarian, hospital librarian, clinical medical librarian, and clinical librarian).

This mediation is envisaged to involve conscious effort in workplace knowledge transfer by mentoring. This process needs recognition as a means of developing the resident paediatricians' information capabilities and knowledge, and also needs systematic support. For example, mentoring which could be by knowledgeable faculty or medical librarian, in their areas of expertise, could be adopted as an informal learning system where the residents develop their information capabilities. The residents could utilise this learning method to develop: their knowledge of diverse medical information sources; their technical knowledge for accessing these sources; and, thereby enabling better access to medical information. The possession of this capability would obviously be capable of influencing clinician decisions during the patient care process and the probable outcomes of treatment.

The hospital librarians' expertise as information professionals could be very useful in a supervisory role in the informal information activities that are already practiced by the paediatricians. The librarians could moderate and supervise the clinicians in: group information searches and the discussions centred on those searches; the development of seminar/interpersonal information skills, and how to prepare for departmental seminars.

A new activity proposed in the framework is the introduction of research partnerships between the hospital librarians and the paediatricians whereby the librarians use their information skills to support clinicians in their personal or group research.

## Theme Two: Information needs

### 6.6 Influences on the clinicians' informal information practices

In this study, the paediatricians had information needs related to their patient care role which reflected the normal expectation. Other studies that have similarly identified patient care and clinical work as the primary precursors of physicians' medical information need include but not limited to, Callen et al. (2008); and, Davies and Harrison (2007). It was therefore also not surprising that the paediatricians expressed several work-role information needs such as: supporting diagnosis and avoiding mistakes, coping with the evolution of diseases, ability to manage difficult and challenging cases, understanding the geographical and contextual peculiarities of managing illnesses. Others information needs they expressed were regarding; drug dosage, keeping up-to-date, and refreshing the memory. These needs were echoed in the findings of Dee and Blazek (1993); Byrant (2004); Davies and Harrison (2007); D'Alessandro et al. (2010) and Yoon et al. (2010) on the general information needs of physicians.

Although these studies reported similarities in the general information needs of physicians, D'Alessandro et al. (2010) reported paediatricians' routine requirement of peculiar information on drug dosage for different ages, child illness conditions and treatment procedure, owing to the category of their patients. This scenario increases paediatricians need for adequate and quick access to drug and other related evidence to support medication decisions, given also that a comprehensive literature review on medication errors in paediatric care revealed that medication errors represent '*a significant percentage of medical errors in children*' (Miller et al., 2007, p. 123). The paediatricians mentioned their geographical context of practice where tropical childhood diseases evolve constantly as a factor that exacerbates this aspect of their information need on a frequent basis.

Preponderant views of participants appear to suggest that paediatricians practicing in the tropics were confronted with a different sort of information challenge from their colleagues in other global regions. This challenge was unconnected to differences in technology or infrastructure availability. The paediatricians inferred that the frequency with which tropical childhood diseases evolve and changes were made to treatment procedures occasioned the type of information scarcity not witnessed in other non-tropical regions. For example, the paediatricians inferred that frequent changes have been made in the past few years on the procedure for treating malaria. These developments border on frequent medication changes and modifications to the evaluative procedure when diagnosing the illnesses.

One of the negative implications of this problem was explained by English et al. (2004) who reveal that, on malaria for example, *'information about the level of consciousness or degree of respiratory distress - features that in the past decade have come to define severe malaria in African children - were often not recorded'*. In their further view this has led to the administration of *'parenteral drugs'* on patients that *'prevent [their] being appropriately reviewed'* (p. 1951). A consultant alluded to this problematic factor in an interview by saying that: *'chloroquine was once used in the treatment of malaria and some people are still practicing that even though it is no longer used'*<sup>91</sup>. This sort of practice shows the extent to which lack of appropriate information, or unwillingness to adopt new information could impede the best possible decision making by clinicians during patient care. This factor could potentially result in unpleasant treatment outcomes for the patients.

In some cases these constant changes exposed the paediatricians to possessing insufficient knowledge on a case-by-case basis and therefore, pre-empted a constant need for keeping up to date with current management procedures because *'appropriate assessment and treatment cannot be assumed'* (English et al., 2004, p. 1951). The majority of clinicians admitted that their first line of action in such situations was to ask their colleagues before consulting sources like textbooks and/or the internet if further confirmations were needed. The recourse to asking colleagues either face to face or through phone calls as first contact was premised on their availability and easy access, while textbooks were used because the clinicians perceived them as providing authoritative (reliable) medical information.

This study therefore has shown that the paediatricians in Nigeria are faced with information drought and resource relevance challenges, over the dearth of medical information resources germane to contextual management of rare and a few tropical illnesses. This combines with severe shortage of current textbooks, relevant information infrastructure and proficient hospital librarian services to foster a very negative information experience.

The study revealed that this dearth of information on rare illnesses foreign to children in the tropical regions was one of the unpleasant information experiences of the paediatricians. This experience very often prompted the clinicians' possessing scant knowledge on how to care for patients in the local circumstance of managing such illnesses.

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<sup>91</sup> Interview 15, female consultant

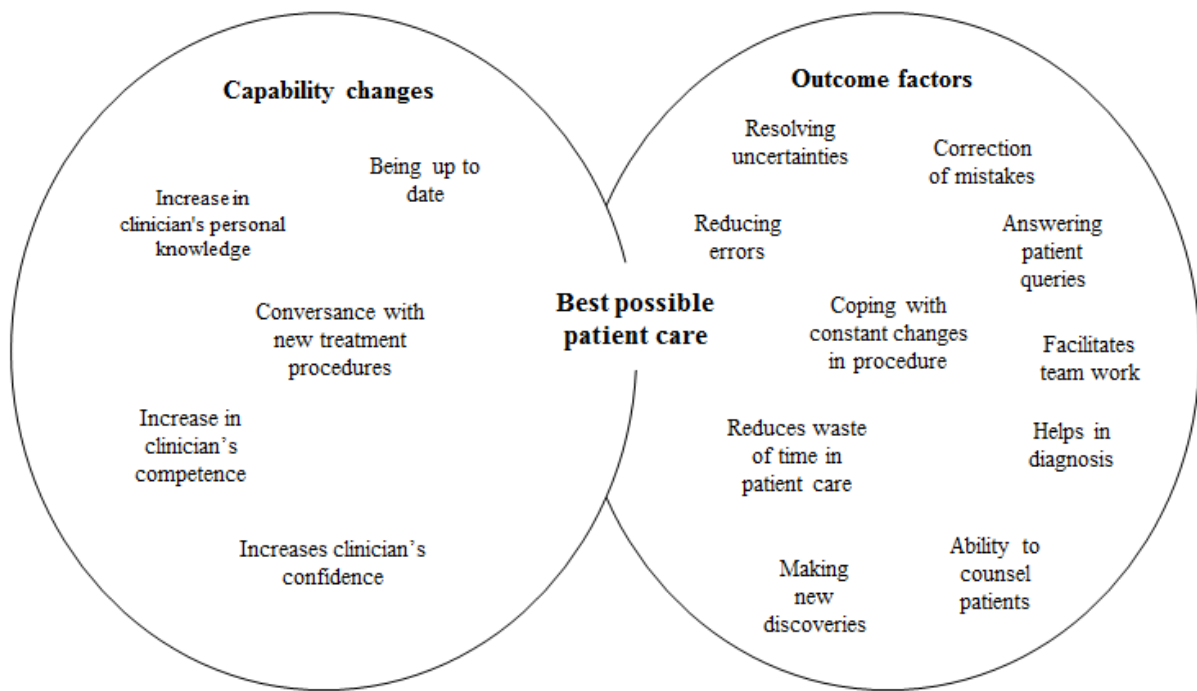
The practice of consulting colleagues' yielded information useful for patient care decisions in many instances for the paediatricians. The shortcomings of this method was that it relied on people's tacit knowledge and personal experience which scholars have not equated with the use of evidence. Although Thornton (2006) has argued that tacit knowledge is *the unifying factor in evidence-based practice and clinical judgement* (not paged), the use of evidence obtained specifically from evidence-based medical information sources for making decisions during patient care, has been intensely canvassed in the past two decades. This perspective began with Sackett et al. (1996), to other scholars such as Fisher and Wood (2007) and Cullen et al. (2011) that have proffered evidence-based medicine as the best option that increases chances of obtaining desirable treatment outcomes during patient care.

### **Theme Three: Information use**

#### **6.7 The paediatricians' use of medical information**

The paediatricians were unanimous on the opinion that the use of information contributes to increasing clinician's effectiveness in patient care and also influencing the probable treatment outcomes. The paediatricians applied medical information for patient care in three broad areas namely: diagnosis and evaluations; drug dosage and administration; point of care support.

The paediatricians' use of information precipitated degrees of change in their capability (see figure 46). The aspects in which the clinicians' perceived changes occurred were: increase in knowledge; increase in competence; increase in confidence; being up to date; the clinician's conversance with new treatment procedures.



**Figure 46: Perceived capability changes and outcome factors of the paediatricians' information use**

These admissions by the paediatricians lend credence to the Knowledge production model of information behaviour espoused by this study. The model espouses that in expressing primary information behaviour, the encounter with and use of information to solve information needs, potentiates new knowledge and further knowledge-based information behaviour hinged on the acquired knowledge. The capability changes and outcome factors in figure 46 are tabulated in table 16 to show relatedness to the concept of: knowledge; and, knowledge-based information behaviour, as espoused in the Kpro model of this study.

**Table 16: Relatedness of the capability and outcome factors with the Kpro model**

<b>Knowledge</b>	<b>Knowledge-based information behaviour</b>
Increase in clinician's personal knowledge	Facilitates team work
Increase in competence	Increase in confidence
Conversance with new treatment procedures	Correction of mistakes
Answering patient queries	Answering patient queries
Helps in diagnosis	Making new discoveries
Ability to counsel patients	Ability to counsel patients
Reduces waste of time in patient care	
Coping with constant changes in procedure	
Reducing errors	
Resolving uncertainties	
Being up to date	

The paediatricians' associated the use of medical information for patient care with different outcomes such as the ability to: reduce waste of time during patient care; correct mistakes; cope with constant changes in procedure; and, counsel patients; resolve uncertainties; broaden diagnosis; make new discoveries; work effectively in teams; and, reduce errors in decision making. Similar results were reported in the studies conducted by Marshall et al. (2013) who studied the value of library and information services in patient care and reported that majority admitted to the use of information having '*definitely or probably*' led to their managing '*aspects of the patient care situation differently*' (p. 38) and resulting in better patient care decision in general. In a weighted order, the specific changes clinicians reported were on: '*advice given to patient, diagnosis, choice of drugs, other treatment, and tests* (p. 38).

Similarly, in the preceding Rochester study, Marshall (1992) revealed that clinicians reported outcome of information-use changes in a weighted order on: '*diagnosis, choice of tests, choice of drugs, reduced length of hospital stay, and advice given to the patient* (p. 169). These findings which corroborate this study, buttress the centrality of information use to a clinician's decision making effectiveness during patient care.

Marshall's (1992, p. 169) further revelation that information provided by the hospital library resulted in clinicians avoiding: '*hospital admission (12%), patient mortality (19%), hospital-acquired infection (8%), surgery (21%), and additional tests or procedures (49%)* adds credence to the findings of this study. It further provides a good basis for the re-evaluation of medical information service at the hospital, presently perceived as highly inefficient. This will lead towards the implementation of a more efficient service capable of contributing to the paediatricians' effectiveness in decision making in patient care. This imperative was echoed in Joseph's (2013) review of the book: '*The Patient Safety Perspective: Health Information and Resources Online and In Print*'. It revealed a clear advocacy of the integral informational role of clinical medical librarians to initiatives about patient safety in all hospitals, when clinicians used the information they provided.

#### **Theme Four: Information seeking behaviour**

##### **6.8 The paediatricians' information seeking behaviour (ISB)**

This study revealed that the absence of formal information literacy training was detrimental to the clinicians' in the use of evidence obtained from electronic evidence sources for patient care. It also exposed that a general perception of poor hospital library service, and a perception of inadequate information infrastructure at the hospital, played a major role in

determining the clinicians' choices of sources and resource types for obtaining medical information. Owing to these knowledge and information service barriers, only a few paediatricians were aware of and utilised online drug information sources for making medication decisions. Drug Reference was discovered to be the only electronic medication evidence source used by the clinicians. Those who utilised this source confirmed that they used their personal devices for access. The majority relied on the use of print version of the British National Formulary (BNF) provided at the consulting rooms and wards for obtaining prescription information, even when sometimes faced with the pressure of quick decision-making in critical care.

Although one clinician recognised that '*evidence-based medicine...removes a lot of assumptions*'<sup>92</sup> the paediatricians' in general possessed inadequate EBM capabilities occasioned by poor information literacy training. Together with the absence of an EBM supportive information service, obtaining medical information through the informal means played the biggest part in the paediatricians' information practices. The types of informal learning that the clinicians' utilised in order to bridge the gaps between their information capacity and their information needs were: independent learning, assisted learning, and collaborative learning, information sharing and learning in practice. Coomasamy and Khan (2004, p. 4) aver that some aspects of these types of learning such as ward round and case discussions could be '*used to learn how to incorporate evidence*'. They however, also conclude that '*clinically integrated teaching of EBM is [the most] likely to bring about changes in [clinicians'] skills, attitudes, and behaviour*' (p. 4).

The paediatricians' informal learning was people-based and human interactions were the chief means of obtaining information. People's effectiveness in obtaining information useful for practice was therefore, conditional to interactional influences. One of those types of influences was described by Chandler et al. (2008, p. 1) as '*social spheres of influence*' that impact physicians' in information gathering and learning in general.

This study's findings revealed that for example, frequent access to the internet was more prevalent among the resident doctors, who had the pressure of passing residency examinations to guarantee career progression, combined with the demands of patient care. Participants of this study attributed factors such as the residents more intensive self-learning efforts, peer-assistance, interest and age as reasons for the differences in their information-seeking

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<sup>92</sup> Interview 15, female consultant

behaviour and possession of better capabilities in comparison to the more senior paediatricians.

One of the observations made by the researcher was that the residents engaged in more social interactions among them at different social spaces within the hospital than the doctors in senior positions. The study revealed a prevalence of collaborative learning activities among the paediatricians in general and which extended to clinicians putting calls across to colleagues at other hospitals when they encountered problematic cases during patient care. Some collaborative practices e.g.: group discussions, were, however, more entrenched among the residents. This could perhaps be borne out of the earlier-mentioned residents' career progression and clinical assessment information needs, exerting tenses pressure on them than the other ranks.

The residents appeared to possess a better appreciation of the informative gains of interpersonal, collaborative practices and were more predisposed to using the means more frequently than their other colleagues for learning. This inclination of the residents' mirrors Lloyd (2010a, 2010b) who advocates information literacy and learning through the socio-cultural route, whereby people learn from interpersonal and group interactions in their social environments, including with colleagues at the workplace. The implication of this however, is that the clinicians need to have the relevant information skills adequate for optimising the informational value of those social interactions, for obtaining useful new knowledge.

This factor affirms the capacity for the spheres of influence in which the paediatricians interacted to determine the differences that exist in how they obtained information to build their capabilities. Perhaps also, the paediatricians' individual predispositions within those spheres, could differently affect their abilities to utilise the interactions for learning and personal development. This finding reveals that the social spheres of people's interactions based on homophily; as demonstrated by the clinicians' pattern of associations, are useful platforms that foster learning among groups. It shows that homophily plays a greater part in the clinicians' associations, information experiences, learning and practices in discharging their everyday professional roles.

This finding portends that those social spheres of learning could form the scaffold for the hospital management when implementing training, aimed at providing the clinicians with skills for ensuring they engaged in good information practices. Put differently, information



capability development programmes at the hospital should aim at being structured on exploiting the advantages of those social spheres that foster learning among clinicians' with a bond of homophily. In essence, group-based learning should be a major focus, and should be exploited with programmes that teach good information practices. It should also be encouraged to thrive, given that it already works positively. However, in taking advantage of these social spheres of learning among the clinicians, focus should also be given to encouraging the enhancement of the already thriving inter-clinician group information sharing and collaboration practices at the hospital (i.e. information exchange interactions among the different paediatrician cadres).

### **6.8.1 Perception and use of hospital information services**

Overall, the paediatricians had a good understanding about a value which medical information use added to their effectiveness in patient care. Majority however expressed unwillingness to use the hospital library services due to factors such as: the out datedness of the textbooks and other information resources, lack of variety in the materials provided, perceived incompetence of the hospital librarians and a generally unreliable internet service. The consequences of the negative perceptions on the clinicians' patronage of the general information services provided at the hospital library are further interpreted in the next sub-heading.

#### **6.8.1.1 Information service rejection behaviour (ISRB)**

The paediatricians were unanimous in expressing disapproval with the provision of inadequate information services at the hospital to cater to their information needs. The lack of priority accorded to the provision of information resources adequate for supporting evidence-based care, coupled with the poor quality of internet and hospital librarian services affected the clinicians' disposition to the use of the services.

The study revealed a high rate of clinicians' non-use of the HINARI electronic information source, low use of the hospital library and non-patronage of the information services of the hospital librarians. This disposition mirrors information service rejection behaviour. The service rejection behaviour about the HINARI database, for example, was reified from the fact that it was provided free at the hospital, yet the clinicians' preferred using other electronic sources both subscription and non-subscription-based to gather medical information.

The extent to which there was no allure for the paediatricians in using the HINARI could be perceived from their preference to bear the cost of access to the other proprietary sources.

This information behaviour in a middle-income environment surprises, given that the cost of personal subscription would expectedly have been a deterrent on the clinicians in favour of HINARI's increased use. The clinicians willingness to bear the cost of subscription to other electronic sources however, aligns with the view of Stigler (1961) cited by Wilson (1997, p. 559), that people '*may well be willing to pay more for the information when supplied in an enjoyable form*'.

Although there was a high degree of willingness by the paediatricians to adopt technology in information access for patient care, this was not the case with the clinicians' use of the HINARI electronic database. A possible cause of this behaviour may be the complaint by majority of interviewees about the slowness and the overall poor quality of the internet service provided by the hospital on which the use of the HINARI was based. The frustrations interviewees associated with the slowness of the hospital's internet connectivity apparently explain this information service rejection behaviour (ISRB). This tends to be the case given that a report by the WHO in 2016<sup>93</sup> indicates that the HINARI was designed to require high-speed internet service to function effectively.

This poor quality of the hospital's internet service which majority of the paediatricians complained about appears the strongest explanation as to why the paediatricians were averse to utilising the HINARI. The difference in levels of use of the HINARI in other countries with this Nigerian case study indicates that the paediatricians' rare use of HINARI was not owing to its lack of relevance to their medical information needs. This inference owes to the reported contributions of the database to improving access to information for medical professionals in those other countries where it was increasingly utilised.

Aronson (2004, p. 968) reported two years after the inception of HINARI in the year 2002, that in the institutions around the world where the database was used; '*HINARI has greatly improved access to information...and the levels of use are growing steadily*'. In this reported growing degree of acceptance, other Sub-Saharan Africa countries which are similar to Nigeria on many indices of socio-economic development, educational and health conditions were included. A report from HINARI in 2008 cited by Parker (2016) made similar claims about increased usage. The report also suggested that the database had made significant

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<sup>93</sup> A report by the World Health Organization in 2016 titled '*HINARI Research in Health*'. Accessed 04 April 2016 from [http://www.who.int/hinari/faq/Access\\_to\\_HINARI/en/](http://www.who.int/hinari/faq/Access_to_HINARI/en/)

impact in advancing access to medical research in developing countries. The findings of this case study did not substantiate these claims with regard to increase in HINARI use and its provision of access to medical research to the paediatricians in Nigeria. The objects of this study rarely used the HINARI database for accessing their medical information.

A study by Walker et al. (2002) identified the reasons for people's adoption or rejection of technologically-enabled information service. These reasons were: individual's sense of capacity and willingness to adopt technology; having access to a professional's service; not seeing the benefits of technology; and, for those with a positive disposition, being a happy and proficient user of technology. None of these factors seemed to be majorly responsible for the paediatricians' rejection of the HINARI. The paediatricians had access to the services of the hospital librarians as information professionals, although their services were generally perceived as poor and some interviewees doubted their professional competence. It appeared therefore, that in general, the frustrations of slow internet service expressed by majority of participants influenced their choice in the non-use of the HINARI. As one interviewee explained, *'what should take you split seconds to access, takes you hours'*<sup>94</sup>.

Additionally, the findings of this study did not align with Walker et al. (2002) as the paediatricians also displayed the willingness to adopt technology by their increased use of other electronic databases and internet sources for gathering medical information. They equally expressed preference for computerised hospital routines, particularly patient records which in their view would ensure easy access to patient information and a more efficient patient care process.

The study revealed that Medscape was the most highly utilised electronic source by the paediatricians. Besides Medscape the clinicians also utilised other online information resources such as the eMedicine, Medline, PubMed, Web MD, Google Scholar and a few others mostly from their personal devices and internet subscription. The paediatricians' recourse to self-help in order to circumvent this negative information experience indicates their possession of a strong awareness and value for medical information use in achieving effectiveness in clinical practice.

Negative perceptions by majority of the paediatricians' about the usefulness and capacity of the hospital librarians to meaningfully contribute to their medical information needs, resulted

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<sup>94</sup> Interview 1, resident, male

in their non-patronage of the librarians' services. This perception runs against the growing practice where medical librarians are incorporated into the '*clinical effectiveness*' processes in hospitals (Marriot, 1998, p. 66). Marriot (1998) stresses further that librarians involvement in ensuring clinical effectiveness '*entails getting the scientific evidence, about which clinical practices work...into everyday clinical practice and evaluating their effect on patient care*' (p. 66). Implementing this suggestion at the hospital appears necessary for ensuring increased effectiveness of the clinical care process.

The paediatricians' negative perception, and persistent non-patronage of the hospital librarians' services for medical information purposes, could potentially result in their developing aversion towards hospital library information service as a whole. This may include any future librarian-led information literacy programmes at the hospital for clinicians, with potential consequences for the loss of useful information that could be needed for taking appropriate patient care decisions.

The clinicians' perceptions about librarians' marginal usefulness, poor information resources and infrastructure provision, has led to their inclination to adopt self-help for mitigating the effects of the perceived lack of adequate information service. In doing this, the clinicians purchased personal information resources and infrastructure for access to the Internet through personal i-media devices such as iPads, smartphones, laptops and tablets. They also subscribed to print and electronic journals, and the purchase of personal textbooks, which they utilised for obtaining information for patient care.

With the aid of these i-media devices and the subscription to electronic medical resources, the clinicians obtained useful medical information which they used mainly for patient care, in addition to improving personal knowledge. The impediments the paediatricians perceived in adequately catering to their information needs through the means of self-provision was the combined problems of cost and the range of resources which they could afford. Another factor was the quality of internet service. This last factor owes to the fact that due to the cost involved, the clinicians could mostly afford internet connections through subscribing to internet services provided by mobile telecommunications companies. The speed provided through this type of access to the internet according to the interviewees, was generally slow, and encountered frequent interruptions due to weak signals.

One consideration that seemed to reinforce this practice of self-provision about, specifically, the internet, although costly to subscribe to, was its perception by clinicians as a highly

relevant source for obtaining medical information. Although this disposition appears inherently positive information behaviour, it could have potential negative long run effects. This is owing to potential cost-induced inability on the clinicians' part, for a continued practice of self-help in resource and infrastructure provision. The sustenance cost of this practice on individual clinicians could hinder the degree of access to evidence sources required for an effective evidence-based practice. If this scenario continues unreversed, it would be in contrast to Arunachalam (1998) and Cullen et al. (2011) who argued that the effective delivery of evidence-based healthcare depends largely on the clinician's adequate access to technology and the sources of evidence.

Another negative impact of this practice is that it provides a false relief for the clinicians in their information service dilemma and also shields the problem from the hospital's management. The paediatricians' self-help activities therefore, appear a costly camouflage that circumvents the inadequacies of information service delivery at the hospital. This disposition hides the problem and hinders the required investment from the hospital's management for improving on the system to bring a permanent solution.

Furthermore, the clinicians desisted from the use of the hospital library textbooks due to the perception that the textbooks were dated and irrelevant. Besides being out dated, the clinicians also noted that the textbooks at both the hospital and departmental libraries were insufficient in quantity and lacked in the variety of subjects coverage on the areas in which they often need information. This negative experience of the clinicians mirrors Kale's (1994, p. 939) perspective that *'health workers in many countries, particularly sub-Saharan Africa, have almost no access to up to date information'*. This study's finding suggests that in the case of Nigeria, the situation remained the same in over twenty years after Kale's (1994) report.

Meanwhile, a decade earlier, *"in the 1970s and early 1980s Nigerian libraries still had up-to-date book stocks, because the federal and state governments had plenty of money from the country's petroleum exports. In the later years the situation changed..."* (Olden, 2015, p. 157). It appears undetermined however, whether this change in situation was caused entirely by the diminished economy or combines with a drift of foresight, and misplaced priority by the management of those Nigerian libraries. In the case of this study, there was a general perception that the hospital management did not prioritise the library in its budgets. However, in general, it may be safe to conclude that *"when money is not an obstacle, good up-to-date*

*library services [can] exist”* (Olden, 2015, p. 172, researcher’s insertion), as was the case in the pre-1990s period in Nigeria, including at hospitals.

The consequence of this dearth of information has now translated that *‘health workers get used to practicing without keeping up to date’* (Kale, 1994, p. 939, quoting a conversation with Ms Patrikios of the University of Zimbabwe Medical Library). This condition portends the obvious risk that the clinicians are exposed to high probabilities of making poor decisions about the health of their patients due to a dearth of current medical information given the level of importance that many scholars have attached to clinicians’ use of information for patient care.

### **6.8.2 Attitudes towards the use of ICT tools and resources**

Interestingly, the study revealed a high level of clinicians’ awareness about the role of information and the usefulness of information and communication technology tools and resources in patient care, despite the preponderance of poor information literacy preparation during professional training at the medical schools. This positive attitude was surprisingly also evident in the increasing willingness of the clinicians to engage in point of care access to electronic medical information resources using i-media devices.

The devices the paediatricians utilised for obtaining point of care evidence includes smart phones, iPads, tablets and laptop computers which were privately owned. This was similar to the report of Rastgoo et al. (2011) and Olok et al. (2015) on healthcare professionals’ use of private i-media devices for patient care in Australia and Uganda respectively in what the latter called *‘E-health’* care that gives *‘healthcare professionals’ access to information to optimize health interventions outcomes’* (p. 1).

Despite this harmony of the paediatricians increasing use of i-media with the increasingly reported practices of their colleagues in other regions of the world, the practice has presently not been adopted by the hospital as a recognised institutional practice for patient care. This implies that without any institutional provision of supportive infrastructure for the practice of E-health care, the clinicians are constrained to find personal solutions to the problem. Clinicians obtained a relief for this poor institutional support from utilising mainly personal information devices for gathering medical information.

Studies by Dala-Ali et al. (2011); Flannigan and McAloon (2011) have however, shown that the lack of institutional adoption of i-media use is gradually being reversed in other regions of

the world. Hospitals in these studies conducted in the UK provided smart phones for the use of clinicians for making patient care decisions. This official provision of i-media devices indicates the adoption of a more pragmatic approach that removes personal costs for clinicians towards the optimization of health interventions outcomes for patients as suggested by Olok et al. (2015).

The growing practice of technology adoption in patient care by the paediatricians mirrors findings in earlier studies such as Lucas (2008) who reported an exploratory use of handheld Personal Data Assistants (PDAs) at health institutions in Ghana, Kenya and Uganda successfully resulted in the implementation of the Uganda Health Information Network (UHIN). The UHIN was deployed for the dissemination of health information to medical practitioners. Similarly, a study by Pandey et al. (2013) identified Smartphone Applications as a useful means of obtaining and sharing medical information.

This increasing adoption of technology by the paediatricians was confirmed in the researcher's observations of the clinicians while they administered care to patients. The trend presents the hospital's management with the opportunity to increase the effectiveness of care given to patients. Achieving this objective requires the provision of adequate infrastructure and capacity development for the paediatricians' effective use of technology for delivering health care to patients.

#### **6.8.2.1 Perceptions and use of the Internet**

Interestingly also, both the diary findings and interviews showed the clinicians' increasing preference for the use of the internet for accessing medical information in their clinical practice, independent learning, and while learning in groups. The clinicians in this study operate in an environment where there is general poor internet use literacy among the populace. However, this finding on their internet use behaviour compares favourably to their colleagues in more technologically-advanced countries.

For example, a study by Romano et al. (2012) discovered that Italian Paediatricians used the internet frequently during practice for accessing guidelines and conducting other medical resource searches. Other studies which reported steady growth in the use of the internet by physicians in general for obtaining medical information include; include Masters (2008a, 2008b); Rice (2006); Hughes et al. (2009). Results reported in these studies indicate that the

doctors found the internet as a useful tool for obtaining information for patient care, for information sharing and for collaboration.

During the interviews, some clinicians expressed the need for the hospital to re-introduce hospital-wide internet service to facilitate easy access to information at all parts of the hospital. This demand re-affirmed the growing popularity and adoption of the internet by the majority of clinicians as a preferred source when in need of accessing medical information quickly. The demand was also imperative because the study revealed that the clinicians accessed information from various locations in the hospital during a typical work day. The locations included the doctors' call rooms, during the ward rounds, during clinical conferences/seminars/meetings, and during consulting/treating patients. Re-activating hospital-wide access to the internet would therefore, be very useful for the clinicians in obtaining medical information electronically, while working at these different locations within the hospital.

Despite this increasing popularity in the use of the internet, some paediatricians expressed apprehension about the reliability of the content of the information obtained from it, and therefore were reluctant to rely on it for treatment information. For instance, some of the clinicians said they would never rely on Wikipedia for making clinical decisions because they considered it as an unreliable source.

This indicates that some of the clinicians were aware of the possibility that inauthentic information could be obtained from open-sources or non-proprietary internet sites. This degree of awareness and consideration of the authenticity of sources was surprising given the extent of the universality of lack of information literacy training for the paediatricians during professional education. This could however, be indicative of the value of experience and interpersonal information sharing on the paediatricians' development of good information practices. It also indicates that introducing training for the paediatricians, in developing their ability for evaluative use of medical information sources, would make immediate impact in their information practices.

The clinicians' possession of this evaluative sense of information use was very interesting and sensitive because a clinician could, in the case of drugs for example, administer an '*Internet-mediated toxic disease*' on patients (Weisboard et al., 1997, p. 827). This apprehension was also echoed some twelve years later in the finding of Rains and Karmikel (2009) that the credibility of websites and the information content on them remained a challenge of their use



as sources for obtaining medical information. This is in spite of its growing popularity and wide acceptance among physicians as widely reported in the literature.

#### **6.8.2.2 Perceptions about implementing the Electronic Health Records system**

Interviewees suggested the need for the hospital to computerise its processes of managing patient files by implementing the Electronic Health Records (EHR) system, to enable much easier access to patient health records. This suggestion shows their awareness of the advantages of digital processes over manual routines in facilitating easier access to patient records and also indicates their readiness to adopt the EHR system in their patient care routines if implemented. This mirrors the findings of Biruk et al. (2014) in a study conducted in Ethiopia, where out of the 606 study participants, 328 (54.1%) indicated their readiness to use the Electronic Health Records system.

The paediatricians' demand for the establishment of an Electronic Health Records Management System at the hospital signals their generally increasing preference for obtaining information through digital means, owing to a perception of easy access. This readiness to adopt an EHR system if implemented surprises when compared to a study conducted in the US (Leu et al., 2012) which found that paediatric adoption lagged general adoption, due to concerns about finance, productivity and appropriateness to needs.

Studies conducted by Egea and Gonzalez (2011), Chau and Hu (2002), Flanagan et al. (2003) reported the usefulness of the introduction of the Electronic Health Records Management System into patient care routines. These studies reported that the introduction of Electronic Health Care Records (EHCR) facilitated effectiveness in physicians' decision making during patient care by promoting precision and eliminating the waste of time in tracing patient records.

In another study conducted in South Africa on the perceptions of Electronic Health Records by hospital staff, Cline and Luiz (2013) report that the majority rated their use of EHR as being very important, considering that it provided '*superior access to patient record information when compared to paper based systems*' (p. 8). These reports therefore lend credence to the request of the paediatricians on the introduction of the EHCR system at the hospital to facilitate clinical effectiveness through quicker access to patient records.

A report has indicated that the implementation of Electronic Medical Record systems have been slower in the developing and less-developed countries '*due to technological, financial,*

*and organizational factors*' (Biruk et al., 2014, p. 1), which act as impediments. This slowness of implementation has implications for negatively influencing the effectiveness of health care delivery to the patients, considering the empirical reports confirming its very high importance to enhancing clinical effectiveness. Any consideration for implementing the EHR system for the paediatricians however, needs to take into cognisance the caution raised by Christensen and Grimsmo (2008), on avoiding the increase of administrative workload for the physicians, and making the patient information contained in each file comprehensive.

Many interviewees attributed the increasing preference for using the electronic means to access information majorly to the advantage of quick access to medical information which its use provided above other sources. A similar reason to this was offered by participants in the study conducted in Australia by Koehler et al. (2013) where healthcare professionals also preferred to use technology due to their perception that conducting information searches on it was quicker and easier. This similarity in the growing use of electronic media for information is interesting, because it shows that the paediatricians in this study were attuned to information practices adopted for patient care in more technologically advanced countries, such as with this case of Australia, despite their general lack of information literacy training.

### **6.8.2.3 Use of electronic medical evidence sources and databases**

Although a general culture of oral communication predominated the paediatricians' routine medical information gathering, the study discovered a growing preference for the utilisation of a variety of electronic sources for quick reference. This leaning towards the use of electronic sources demonstrated the clinicians' increasingly diversified information-seeking behaviour away from conversations with colleagues and the use of print textbooks as the traditional sources of information.

The paediatricians used non-proprietary electronic sources more frequently than the subscription-based sources. This was due mainly to the cost implications which they encountered in providing personal access to paid sources, to substitute for the hospital library's inability to provide the electronic sources they required. Another reason proffered by some clinicians was the technical difficulty they encountered in completing payments for the information resource they required from subscription databases.

These impediments resulted in the paediatricians being limited to the use of non-proprietary electronic sources of medical information in majority of cases. The concern this limited

information practice raises is that some of these non-proprietary sources would probably not offer medical information to the level which Harrison and Beraquet (2009, p. 130) described as '*first class evidence*' needed for the appropriate care of patients. Data from the diaries confirmed interview findings about the clinicians' minimal utilisation of all other electronic sources besides the Medscape that was the most popularly utilised by clinicians across the ranks.

This research identified that the paediatricians did not use other more popular evidence based sources, for example, the Cochrane Library or the electronic version of the Integrated Management of Childhood Illness (eIMCI) protocol of the World Health Organization. The use of the eIMCI for example, was reported as having the potential to reduce the morbidity and mortality of under-five children when clinicians used it accurately (Mitchell et al., 2013).

Some reasons were identified in the study as influencing the paediatricians' choices in the use of different medical information sources. These reasons include: reliability, type of needed information, availability, and accessibility, speed of access, usefulness, format of resource and scope covered by the resource. The paediatricians' preference of Medscape as the most frequently utilised electronic medical information source might have been influenced by some of these factors.

Overall, the study has revealed that despite the challenge of poor information experiences, paediatricians in Nigeria are open to adopting good information practices for patient care. For example, point of care information access and the use of some electronic medical databases for information gathering in aid of making decisions during patient care and for personal knowledge.

### **6.8.3 The paediatricians' information seeking behaviour during critical incidents**

This study used a critical incident technique to probe the information seeking behaviour of the paediatricians when handling critical patient care incidents. Additionally, to ascertain whether the clinician's practice experience orchestrated differences in the informational choices made during the critical incidents, the clinicians were divided into two groups – the residents and the registrar-consultant group.

The findings show that the residents were more inclined to utilising oral information such as inter-personal conversations, than the internet as first option for obtaining information support, while managing critical incidents. This information behaviour of the residents was surprising

because in other everyday contexts they used the internet more frequently than other clinicians and possessed more internet-use proficiency and dexterity than their senior colleagues.

Although the reports of studies conducted in the UK, Gabbay and May (2004); and in Tanzania, Chandler et al. (2008) respectively, revealed similarly that doctors rarely relied on knowledge obtained from explicit sources for decisions during patient care, the studies did not specify clinician ranks and were not specifically conducted on critical incidents. Doctors in these studies also preferred to utilise oral information from the tacit knowledge obtained from colleagues through interpersonal interactions. Chandler et.al (2008) refers to this practice as the use of '*mindlines*' instead of '*guidelines*' (p. 1).

The residents' information behaviour when managing critical incidents contrasted with findings about the other clinicians in the ranks of registrar-consultants who preferred using the internet as their first option for obtaining information to support their decisions. This group's information behaviour during critical incidents conflicts with reports contained in Gabbay and May (2004) and Chandler et al. (2008).

Perhaps the explanation for this difference lies on the experience of the more senior clinicians affording them superior ability and knowledge to manage the critical incidents, with lesser need for reliance on colleagues for information support. These findings have implications for the provision of adequate clinical decision support system for the residents' decision-making during critical care. This is very pertinent due to the fact that information from colleagues cannot always effectively substitute for factual medical evidence in patient care. The findings also point towards the necessity for providing adequate, functional internet service, and technology infrastructure for the use of the registrar-consultants in accessing information for making decisions while in critical care situations.

Every interviewee in both groups admitted that obtaining reliable information to support clinical decisions is very necessary during critical patient care. Some of the outcomes the clinicians attributed to the information obtained and used during the critical incidents include; understanding of the appropriate procedure to follow, increase in confidence about the diagnosis and initial treatment procedure and the modification of initial treatment procedure, specifically, on drug administration.

The clinicians' accounts of the critical incidents revealed that with the exception of one case of eventual death, attributed to the illness being terminal, majority admitted that the critically ill patients made progressive recovery, when they were managed with the information obtained in the process of their care.

#### **6.8.4 The Paediatricians' other general information behaviour**

The study revealed that other specific factors that influence the clinicians' choices in the use of information sources to meet their information needs include; reliability and authenticity of the information source. This factor confirms Carr et al.'s (2011, p. 136) perspective on the imperative for physicians to acquire skills relevant for evaluating the authenticity and reliability of the medical information they obtain. Others factors that influenced the paediatricians' choices were; usefulness of information source to information need, the format of the information resource, clinicians' ability to make comparison with other sources and the scope of the information resource coverage.

The clinicians used both oral and documentary information sources for meeting their information needs. However, oral information was the most pervasively and constantly utilised source by the clinicians on a day to day basis. This form of information was obtained through participation in collaborative learning at informal and semi-formal meetings including discussion groups, clinical conferences and team discussions at consultants ward rounds. These forums, coupled with the openness of people to engage in impromptu inter-personal discussions, contributed to fostering the culture of information sharing existent among the clinicians. Information sharing and collaboration among the clinicians also involved collaborative searches on electronic sources using mostly personal i-media devices and knowledge exchanges with colleagues working at other hospitals through phone calls, done in most cases at the point-of-care.

Diary findings also revealed that clinicians pervasively utilised oral means for information sharing. Similar to the interview findings, this practice was done through group discussions, clinical conferences/seminars; consultants ward rounds and inter-personal conversations. It appeared however that the intensity with which the resident doctors engaged in these forms of information gathering and learning activities was much higher than the consultants. Some resident interviewees ascribed the perceived eased-off commitment of consultants to information seeking to their having reached the apex of their careers and their greater experience in practice. This indicates that the motivations for the higher intensity of

information seeking among the resident paediatricians includes not only their patient care needs, but also their level of experience and further education for a successful career progression.

The sharing of oral medical information among the clinicians was predicated on an enormous regard to seniority in rank and experience. Clinicians assumed, for example, that the consultants possessed superior knowledge to others, owing to their years of practice experience. For example two interviewees said:

*“...there are some cases that you cannot handle and you go to your consultant. He has more information than you, because even among doctors there are different levels of information”* (Interview 3, Resident, male).

*“I am a Resident doctor, the consultant owns the patient and even if he’s not there, I can put a call across to him and he will come and review with me. If he’s not on duty at that point we’ll discuss on phone...”* (Interview 2, Resident, male).

On the basis of this assumption and practice, consultants were formally vested with the responsibility of teaching and guiding other clinicians. Information sharing took place during ward rounds, clinical conferences and other departmental meetings. Sometimes also, the information sharing and coaching took place during other non-clinical and even informal encounters.

Sharing information orally was the prevalent means through which the paediatricians in higher ranks trained the junior ones. The presumption of information authority was in a top-down order from the consultants to the house officers. The opportunity provided by those oral and practical patient-care-based interactions at the ward rounds, enabled the junior clinicians to learn in practice.

In general, because the clinicians worked in teams at the various paediatric units, those team-based interactions facilitated knowledge sharing and collaboration among them. When there were arguments in a team, for example over a procedure or prescription, the consultant’s opinion was more often than not, regarded as the authentic information. This was normally the case, except where the consultant referred the team to a search for the needed information, when s/he was uncertain about what was required. In such cases, the consensus information obtained from that search was as a rule, approved by the consultant before being used for treating a patient.

Paediatricians deferred to the information authority of the consultants within this information sharing and use context in daily clinical practice. This generally reflected the paediatricians' adherence to the hierarchical nature of clinical practice. The knowledge clinicians gathered through this means had the tendency to ameliorate the negative impacts on the paediatricians, of the lack of time to search for medical information for clinical practice and professional development. Almost every interviewee attributed lack of time as a major impediment to their pursuit of answers to information need that arose either during patient care or was required for enhancing personal knowledge.

In a surprising finding, the consultants revealed that at some occasions they also learnt from the junior paediatricians' information and knowledge that was useful for patient care and personal development. One of the consultants inferred that this was because clinicians in the lower ranks, particularly the residents, were more prone to searching for current medical information from online sources. As a consequence of this information behaviour, the residents displayed knowledge of more current information ahead of others.

This admission of learning intermittently from the junior clinicians was a surprise, considering the hierarchical nature of clinical medical practice in hospitals and its associated flow of information power. This finding displayed a valuable aspect of the consultants' information behaviour in imbibing shared information from colleagues. The consultants exhibited readiness for obtaining new knowledge from those encounters, without regard to the rank of the clinician who provided the information.

#### **6.8.4.1 The paediatricians' sources of evidence**

Although there was prevalence of clinicians' use of oral sources such as interpersonal conversations and group discussions for information sharing during day to day clinical activities, standard textbooks were considered by most participants as the primary reference information source for medical evidence. This perception owed to the clinicians' consideration of textbooks as the most authentic source of obtaining medical information useful for making patient care decisions. The paediatric textbook that was most pervasively utilised by the clinicians was the Nelson's textbook of Paediatrics because it was considered by the clinicians as the most authoritative source of medical information in paediatrics.

Documentary sources of information the clinicians noted as utilised in the diaries were similar to the findings of the interview. It shows that the Nelson's textbook of Paediatrics was the

most pervasively used print source while the Medscape was the most pervasively used online electronic information resource. Other reports consistent with this finding are Bennett et al. (2004, pp. 33-34), Green et al. (2000, p. 220) and Thompson (1997, p. 189) that indicates physicians preference for the use of textbooks and journals as the most important sources of medical information.

The clinicians' preference for textbooks as the primary source of reliable information was not supported by the availability of current resources held at the hospital library. This out of date textbooks resulted in a general apathy in the use of the hospital library by the paediatricians. Majority of clinicians who rarely used the hospital library indicated that besides lack of time, the out datedness of textbooks in the hospital library was the next main factor that deterred them from using the library. This factor however reflects the conditions in most low-income countries where physicians rarely used the hospital libraries owing to '*poor and outdated collections*' (Norbert and Lwoga, 2012, p. 174).

Although the clinicians obtained information regularly from the internet, they regarded textbooks as the more reliable source in terms of content. The clinicians apparently relied on internet-mediated information in making clinical decisions only when they could not get the required textbooks. Many clinicians reported the lack of current textbooks at the library as the reason for their use of the internet instead in some information searches, since they could not personally purchase every textbook they required.

The oral sources of information used by the clinicians included information from the patients. The physicians' perceived information supplied by patients as useful in the diagnosis of illnesses and sometimes influenced the treatment outcomes. However, one of the barriers clinicians encountered in accessing this type of information was the occasional lack of openness by some patients/or their parents, owing to language difficulties, level of education and unwillingness to freely share information. The participants revealed that patients/parents unwillingness to give information always became tenser when they were requested by the clinicians to participate in giving information for research purposes.

Another barrier associated with the oral means of obtaining information was the introverted information behaviour of some clinicians. Some interviewees noted that the few clinicians with this behaviour assume that they possessed the ability to obtain the information they needed personally, without regular recourse to interactions with colleagues. This barrier to



information sharing indicates that individual behavioural differences affected the physicians' dispositions to information-seeking.

These factors agree with Wilson (1997); Sonnewald and Livonen (1999); and, Case (2007) posit that people behave in different ways towards seeking information in an information environment due to a number of mediating factors including psychology. Perhaps this behaviour is attributable to the clinicians' lack of social interaction skills or their avoidance of being negatively perceived by colleagues as incapable of solving their information needs personally.

#### **6.8.4.2 Independent learning**

Learning independently through personal studies was discovered in this study, as one of the strongest information practices of the paediatricians. From the interview data and the diary records it was observed that the clinicians displayed awareness about the value of medical information use in patient care and for personal development, through the utilisation of several oral and documentary sources in their personal studies and research. The most popular independent learning activity of the paediatricians was the reading of textbooks which were in most cases, personal copies.

In another type of independent learning, the need to gain understanding about the outbreaks of childhood diseases intermittently necessitated the conduct of community-based researches by clinicians in the community medicine unit. The reasons a paediatric epidemiologist gave for this was the *'need to know ... the cause of the outbreak, the possible control measures and also be[ing] current with the standard treatment available'*<sup>95</sup>. In order to gain this needed understanding the clinician further required to *'engage with the communities for information gathering'* through personal research.

The integral role of medical librarians in providing information support that improves not only the effectiveness of these types of research but also the clinician's skills for conducting such studies have been espoused in many recent studies. The type of greater dynamism urged by Harrison et al. (2013) and Harrison and Beraquet (2009) on greater collaboration between health librarians and other health care professionals would be required at the hospital. The increased synergy would integrate professional informational roles into the paediatricians'

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<sup>95</sup> Interview 18, a female resident and Paediatric Epidemiologist

community research activities in what has been described as '*research partnership*' (Halsted et al., 1989, p. 300) for increased effectiveness.

The clinicians' effectiveness in conducting those community researches requires their possession of appropriate research capabilities. Carr et al. (2011) inferred the imperative for physicians to acquire skills relevant for evaluating the authenticity and reliability of the medical information they obtain from all information encounters. With the inadequate preparatory information literacy training the clinicians in this study received, it is doubtful that they possess capacity to conduct research effectively. Using an Australian case to underscore the importance of such preparatory trainings to clinicians' capability to conduct independent research, Simons et al. (2012), reveal that The Australian School of Advanced Medicine at Sydney provides post-graduate training for physicians, with one of the emphasis as lifelong learning. This training consequently '*becomes a motivator for independent, lifelong learning*' for the clinicians (p. 291).

Although socio-economic, resource and manpower differences exist in the professional training contexts of the resident epidemiologists in this study with those in the case of Australia above, they nonetheless require this type of information skills for lifelong independent study. It would be very necessary for paediatric residency post-graduate trainings in Nigeria, to incorporate the development of capacity for this type of independent lifelong learning, in order to adequately prepare them for conducting meaningful research.

### **Theme Five: Information literacy needs**

#### **6.9 Information literacy needs**

Almost every medical school where the clinicians trained taught manual methods of information access and use with only few providing minimal training on the use of digital information sources. This finding is in disharmony with Click and Petit (2010); Luo (2009) and Fernandez-Villavicencio (2010) findings that the integration of digital training , specifically, the use of Web 2.0 and social networking tools facilitate students in becoming information literate.

The lack of adequate information literacy training resulted in many clinicians having limited capabilities in, for example, their knowledge of information sources; ability to conduct targeted searches successfully on online electronic information sources, ability to navigate

through electronic databases unimpeded by technical difficulties, ability of some to use the internet, and ability of some to successfully make subscriptions from electronic information resources. This finding does not conform to the emphasis made by SCONUL (2011, p. 3) that *'information literate people will [correctly and adequately] demonstrate an awareness of how they gather, use, manage, synthesise and create information and data'*. A study of the information seeking behaviour of General paediatricians by D'Alessandro et al. (2004, p. 64) found that there were higher rates of questions pursued and answers obtained by the paediatricians following an information literacy programme intervention.

Brettell (2013, p. 1) emphasised the need for health librarians to be involved in *'training clinicians to undertake their own searching'* in support of capacity development for an evidence-based practice. Harrison and Sargent (2004); Harrison et al. (2013); and Marshall (2014) are other studies that have similarly espoused the integral role of health librarians in providing information support and information literacy training to clinicians.

Another finding showed that a good number of the clinicians regarded the internet nebulously as an information resource without any form of distinction between sources. This level of knowledge mirrored their incapability to differentiate between the various resources accessible from the internet. A similar gap in knowledge was identified by Davies and Harrison (2007, p. 91) in a study of doctors in the UK where the clinicians regarded the British Medical Journal and Cochrane Medical Database as Internet search engines displaying poor internet information literacy. Aslani and Williams (2010, p. 209) and Burke (2010, p. 248) suggest the need for *'online information literacy'* to solve this problem. Burke further suggests that this was important so people can overcome and adapt to *'the challenges of the technological age'* (p. 248).

This factor highlights the imperatives of adequate early-intervention information literacy for the paediatricians introduced at the pre-clinical stage of their medical training. This would provide the necessary grounding for their development of ability to effectively utilise the knowledge obtainable from the informal social interactions to which they are presently more predisposed and also explicit sources *'to learn how to incorporate evidence'* during actual practice (Coomarasamy and Khan, 2004, p. 4).

One of the attributes associated within the social interactionist route to learning is the ability of individuals within a characterised community such as physicians, to learn passively. This is due to the individual's understanding of, for instance, the language of discourse, associated

meanings and norms within the social group (Lloyd, 2010 a). An interviewee alluded to this by referring to clinicians' background medical training as the basis upon which they could understand the information they received. This perception reflects Case's (2007) view that people's information seeking relies on their prior knowledge as the basis, and also mirrors Chandler et al. (2008, p. 1) who aver that '*the influence of initial training within a context*' conditions clinicians' towards information use in practice.

Providing trainee clinicians with appropriate information literacy education early during their training, is necessary to avail them of this '*influence of initial training*' Chandler et al. (2008, p. 1) to complement their inclination towards the informal social interactionist learning methods, through the possession of adequate information skills.

#### **6.10 Other factors affecting the paediatricians' information practices**

As in other studies: Ely et al. (2005); Norbert and Lwoga (2012); D'Alessandro et al. (2004), the paediatricians attributed lack of time due to patient care load as one of the main reasons why they often failed to pursue answers to their information need through an information search. The secondary effect of a heavy patient care load was the stress and fatigue reported by some of the clinicians, about which they claimed also reduced their ability to search for information when in need.

It was interesting to observe however, that despite the clinicians' complaints about lack of time, that majority unconsciously engaged in several information activities in search of answers to information needs, although these activities were predominantly informal and oral. Majority would for instance ask their colleagues when they encountered information need and people routinely engaged in unscheduled and scheduled discussions for sharing knowledge. These informal information activities were perceived in many cases to have yielded answers for the information needs of the clinicians.

It appears that in order to fully maximise the information potentials of their informal information activities, the clinicians require a recognition of those informal encounters as integral to their medical information seeking. The clinicians apparently need an understanding of the value of information obtained through those informal information activities towards their information needs. They also require the development of interpersonal information skills necessary for obtaining clinically useful information from those informal information activities.

Another barrier faced by the paediatricians was that clinical librarianship service was not provided at the hospital to support the paediatricians' daily information needs during patient care. Information services provided to by clinical librarians have been reported to be useful especially in emergencies for clinical decision making, and have become an increasing feature in hospitals at many more-developed countries (Ward, 2005; Harrison and Sargeant, 2004; Weaver, 2011; Gilbert, 1999; Lappa, 2005). The service has also been reported to orchestrate changes in the information behaviour of clinical teams (Urquhart et al., 2007).

The clinical information services provided at those hospitals include; '*daily learning packages*' that assist clinicians to write morning reports (Weaver, 2011, p. 402), and quick '*on site referencing*' that serve clinicians during critical incidents and emergency cases (Gilbert, 1999, p. 69; Lappa, 2005, p. 125). Also clinicians are provided with specific evidence-based guidelines (Keating et al., 2004) during patient care. The challenge faced by the paediatricians due to the absence of these services was highlighted by Clarke et al. (2013) who averred that clinicians' inability to obtain information while making clinical decisions '*impacts the quality and outcome of decisions*' (p. 179).

The peculiarity of paediatricians' information needs in aspects of decision-making that are not general to all physicians, heightens the imperative for providing them with adequate information service towards supporting evidence-based decision making. This imperative was echoed in a study of paediatric physicians in primary care by Norlin et al. (2007, p. 396) which revealed that in 20% of visits to the primary care centres, paediatric physicians lacked ready answers to questions they were asked by patients or asked by their colleagues. This situation is contra indicatory to effective healthcare delivery, about which many scholars have suggested needs effective information support.

This study revealed that the paediatricians encountered a dearth of local resources when they had information needs on some illnesses especially those that rarely occurred in the tropics. One of the reasons discovered to precipitate the paediatricians' information need was their understanding of the geographical context of managing diseases, particularly those diseases that were rare locally. This, together with information on new technologies, was also a major reason physicians in Tanzania gave in a case study conducted by Norbert and Lwoga (2012) on the information seeking behaviour of physicians. This dearth of medical resources on some subjects was attributed to the fact that geographical and contextual peculiarities in illness occurrence affect medical resource publication and the probability of its availability.

This factor highlights the impact of limited local publishing and the paucity of information it engenders on the information experiences of the physicians in obtaining medical information relevant for patient care on given topics. Kale (1994, p. 939) described this paucity of relevant information in the developing worlds as '*a chronic feature of health care*' that incrementally lulls physicians into a lethargic mind-set that accepts their continued delivery of health care, without any more seeing the need for the provision of up to date information necessary to support their practice. Delivering health care under this condition portends the probability that unwanted outcomes from physician-patient illness treatment encounters could be obtained.

Also, due to the preponderance of medical resources published in the western countries, a concern this factor raised among the clinicians was about the appropriateness of the resources to the contextual management of diseases in tropical countries. Commenting on this barrier Kale (1994) said '*some of the information needed by developing countries – for example, epidemiological data – needs to be generated by the countries themselves*' (p. 939). Watts and Ibegbulam (2006) similarly suggest that some of the resources published in the west do not have exact contextual application in managing illnesses in tropical regions, particularly in sub-Saharan Africa. This combined problem of information drought and information relevance, needs increased research activities and local publishing of medical texts, in order to meet the needs of the paediatricians' local contexts of childhood disease management.

The paediatricians encountered some other social barriers to their information practices in relation to negative perceptions by patients. For example, some clinicians noted that patients attribute lack of knowledge and incompetence to the practice of point-of-care information access and use. Although the clinicians' acceded to the usefulness of this practice in facilitating clinician effective decision making, they believed that the negative perception deters people from frequently employing the method during patient care.

# Chapter Seven

## Conclusions and Recommendations

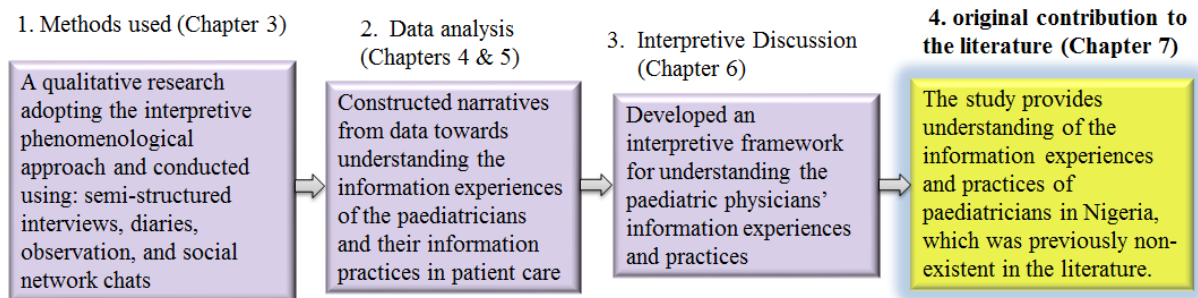


Figure 47: Conclusion and research contribution

### 7.1 Introduction

This conclusions and recommendations chapter is aimed at achieving the goals stated in box 4 of figure 47.

The overall aim of providing understanding of the information experiences of Paediatric physicians in Nigeria and how this influences their information practices for patient care has been achieved in this exploratory study.

The study has also met the specific objectives of providing understanding of: i) the physicians' awareness, perception and experience of information literacy for patient care; ii) the influence of the physicians' information experiences on information practices for patient care; iii) inhibitors to the physicians' information experiences and information practices for patient care; and iv) the potential implications of the physicians' information practices for providing care to patients. These are summarised as follows:

## 7.2 Revisiting the objectives

### Objective 1

The *first specific objective* of this study was to provide understanding of the physicians' awareness, perception and experience of information literacy for patient care.

There was haphazard approach to information literacy tuition during professional preparation at the respective medical schools where paediatricians' trained. This orchestrated inadequate and varied information practice capabilities for the physicians. Despite this negative experience, the paediatricians other information experiences have instilled in them the perception that access to, and correct use of medical information enables the provision of appropriate healthcare.

In general, the paediatricians' possessed a good degree of awareness about the value of information for patient care; however, there was inadequacy of appropriate supportive information services at the hospital to ensure they maintained good information practices. The poor and unsatisfactory information services of the hospital library had resulted in paediatricians developing **information service rejection behaviour** (ISRB) towards the ineffectual services.

### Objective 2

The *second specific objective* of this study was to provide understanding of the influences of the physicians' information experiences on their information practices for patient care.

The major negative influences found were the paediatricians' inability to effectively use evidence sources in patient care, due mainly to inadequate knowledge of evidence-based practice, lack of knowledge about evidence sources, poor navigational skills and inadequacy of available resources at the hospital.

Oral-based sources, usually colleagues, were chiefly utilised for obtaining medical information, however, there was a growing interest in the use of the internet and other electronic sources, including at the point of care. Although the use of Medscape was very popular, the paediatricians' most preferred source for obtaining medical evidence was textbooks due to a perception of reliability of content.



### **Objective 3**

The *third specific objective* of this study was to provide understanding of the inhibitors to the physicians' information experiences and information practices for patient care.

There was lack of adequate information skills due to poor information literacy tuition evidenced in inadequate knowledge of information sources and their appropriate usage. Other identified barriers were; poor hospital library services including; lack of current books, information literacy programme for clinicians, support for evidence-based practice and poor internet service. The costs to the paediatricians for undertaking self-subscriptions to information devices and resources hindered adequate access to information.

The paediatricians equally contended with the paucity of knowledge caused by a dearth of local medical resources appropriate for the contextual management of rarely occurring, and some other types of tropical childhood diseases.

### **Objective 4**

The *fourth specific objective* of this study was to provide understanding of the potential implications of the physicians' information practices for providing care to patients.

The paediatricians' over-reliance on textbooks as sources of evidence, and oral sources in every day clinical decisions, could in the case of books, result in their utilising superseded information for making decisions on patient's health with potential negative consequences.

The prevalent use of oral medical information from colleagues for patient care decisions, does not guarantee reliability of information use. This factor is more problematic for the residents who also depended on the use of oral information during critical patient care. Furthermore, the general lack of capacity for evidence-based practice among the paediatricians could negatively affect the quality of clinical decisions and the eventual outcomes of patient care.

Positively, the rise in the popularity of the internet and point of care information use, as different from over-reliance on tacit knowledge, could if properly directed, potentially increase paediatricians' effectiveness. This will be a resultant effect of their increased ability to make quick patient care decisions.

### 7.3 Summarized answers to the research questions

It is evident from the conclusions made under the objectives that the study has answered the research questions as follows:

#### **What information experiences do paediatric physicians in Nigeria have?**

- The paediatricians experienced inadequate information literacy tuition during professional training leading to their adopting mainly an informal information culture that was largely dependent on human sources for medical information.
- There was a strong value for and practice of information sharing and collaboration among the paediatricians
- There was ineffectual hospital library information service (evidenced in: librarian ineffectiveness; outdated/insufficient resources), inadequate information infrastructure, resulting mainly in paediatricians' adopting self-help measures.
- There were limited sponsorships to conferences/workshops/seminars and other continuous medical education (CME) programmes for the paediatricians.

#### **In what ways do paediatric physicians in Nigeria engage in information practices towards patient care?**

- Paediatricians' preferred the use of textbooks for evidence, while colleagues were primarily the source of routine information (interpersonal discussions, group studies, internal seminars, and other forms of collaboration/information sharing).
- The use of the Internet and electronic medical sources is increasingly popular, accompanied by a growing interest in point of care information access, mainly from personal portable i-media devices.
- When managing critical incidents, resident physicians preferred obtaining information from colleagues, while clinicians in the higher ranks of registrars to consultants preferred using the internet.

#### **Does the paediatricians' information experience have implications for their information practices and patient care?**

- The paediatricians' negative experiences with the information services at the hospital library, contrived **information service rejection behaviour (ISRB)** evident in the rare use of the library, the librarians and the HINARI electronic database.
- The paediatricians possessed inadequate knowledge and skills for evidence-based practice due to poor EBM and overall information literacy training.
- There is probability that their inability to use '*first class evidence*' (Harrison and Beraquet, 2009, p. 130), could affect quality of clinical decisions and patient treatment outcomes.
- Over-dependence on textbooks for evidence portends that superseded information could be used for clinical decisions, even as colleagues could offer anecdotal information with probable negative consequences for decisions about patients' health.

## 7.4 Research contributions to literature base

This research has made the following theoretical, practical and methodological contributions to the literature base:

### First: The Knowledge production model (Kpro) of the paediatricians' information behaviour

A unique contribution of this study is a new model of information behaviour developed from the findings on the information experiences and practices of the Paediatric physicians. This is the study's **main theoretical contribution** to the literature in the field in information behaviour research. The new model is entitled: **Knowledge production model (Kpro) of the paediatricians' information behaviour**, as shown in figure 48.

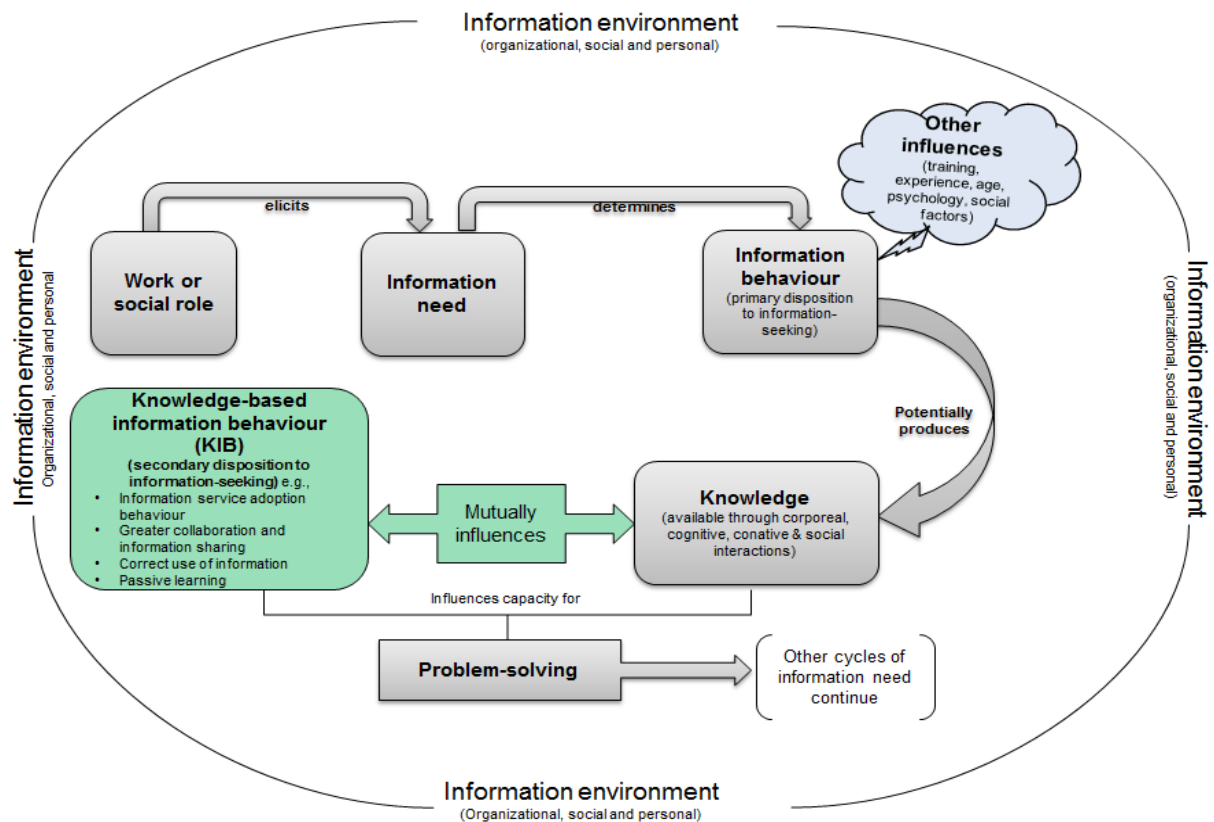


Figure 48: The Kpro model

The Kpro model extended the existing information behaviour perspectives, by showing how information behaviour induces the knowledge that further creates knowledge-based information behaviour. This behaviour was hinged on knowledge the paediatricians obtained from previous experiences with information-generating sources: documentary, electronic, and human. The new behaviour was predicated on the individual assessments of the relevance and

usefulness of information sources and services in subsequent information activities which were aimed at solving further information needs.

Previous information behaviour perspectives expressed in the literature generally missed this point by attributing information need as the precursor of people's information behaviour and information use. Previous information behaviour perspectives postulated a direct connection between people's information behaviour and their information use. A synopsis conducted on previous information behaviour perspectives, revealed a rare identification of, or emphasis on the outcome of information behaviour, which was the knowledge elicited by that behaviour. Subsequently, the different models of information behaviour failed to indicate that it was the knowledge generated by information behaviour which facilitates and scaffolds people's capability for information use.

As a result of this unidentified and unexplained factor of knowledge, popular propositions converged on the acceptance that information use was a direct outcome of information behaviour. This perspective is erroneous because it inferred the elimination or non-occurrence of the knowledge which undergirds information use as the outcome of information behaviour.

This grey area in current information behaviour thinking was identified through the findings of this study and explained in the Kpro model. The Kpro model explained what the knowledge-based information behaviour demonstrated by the paediatricians in pursuing their information needs was. The Kpro model concludes that this secondary information behaviour demonstrated by the paediatricians' was premised on the knowledge that resulted from their primary information behaviour. This study posits that this finding echoes an information behaviour outcome that could be reflective of other information environments where people express their information behaviour for meeting their information needs.

### **Second: Knowledge-based information behaviour (KIB)**

This study made another **theoretical contribution** to the literature base with the design of a model describing **knowledge-based information behaviour (KIB)**. This information behaviour was identified in the paediatricians' information practices. The KIB concept, therefore, extends predominate discourse in the information behaviour field by showing the existence of an intermediate factor between people's information behaviour and their information use in problem solving and other contexts. Prior to this research contribution, the

prevalent perspective in information behaviour literature was that peoples' information behaviour resulted directly into information use. This erroneous perspective neglected the intermediate role of the knowledge obtained from expressing information behaviour, and the KIB dispositions people developed as a consequence of that knowledge.

### **Third: The ILST model**

The study's findings were used to design the **ILST model** which suggests collaborative information literacy training for the Paediatricians in residency training in Nigeria. The suggestion is for this training to be mediated by the medical faculty and librarians. This is the study's **contribution** to existing body of work and most importantly, practice.

The ILST model proposes a suitable tuition framework to adequately inculcate information literacy, as premised on the deficiencies revealed by the study on paediatricians' present information literacy practices. The ILST is envisaged in particular, to contribute to solving the problem of overarching orality of the paediatricians' information behaviour, which rarely supported appropriate evidence-based practice.

The ILST model essentially demands that besides a didactic tuition of formal information literacy courses; that the information literacy programme takes into account the oral aspects of the paediatricians' information-seeking behaviour, in line with the study's findings. Consequently, interpersonal methods supervised mainly by the librarians and medical faculty would be best suited for developing this aspect of information literacy skills. The study presumes that factoring the paediatricians' oral-predominate information behaviour into an information literacy programme will yield desired result in inculcating overall good information practices.

### **Fourth: Methodological contribution**

The fourth contribution of this study is in the field of research methodology. The methodological contribution of this study was the success it achieved in using the diary keeping method for obtaining research data from a time-conscious group of medical professionals. Current literature indicates that researchers sparsely used this method for data collection. The reluctance researchers' display in using the diary method has been attributed to the factors of participant unwillingness and inconsistency of people in keeping the diary

records. Therefore, achieving success with participant diaries was more amplified by this sparseness of its use in the majority of previous social science research.

In this study, diary participants were self-selecting on the request of the researcher, and the majority that consented duly kept the diary records. It is worth mentioning that none of the participants had ever had a previous experience with participating in a research that involved keeping diaries. Although many expressed surprise by the method, they participated nonetheless, and willingly. This shows that a research method novel to participants could be used in a developing world context to collect qualitative research data. However, this was conditional to the researcher ensuring that the participants were made to understand the purpose of the study, as was the case in this study.

Achieving this methodological success was novel and interesting, because the research was conducted in a developing world context where the research culture is presently rudimentary, slowly evolving, and the conduct of research are very limited at present. This indicates that where the researcher invests time and reasonable effort to develop a friendly and cordial relationship with participants in a disadvantaged research setting as in this case, there is possibility of obtaining good participation from the objects of the study.

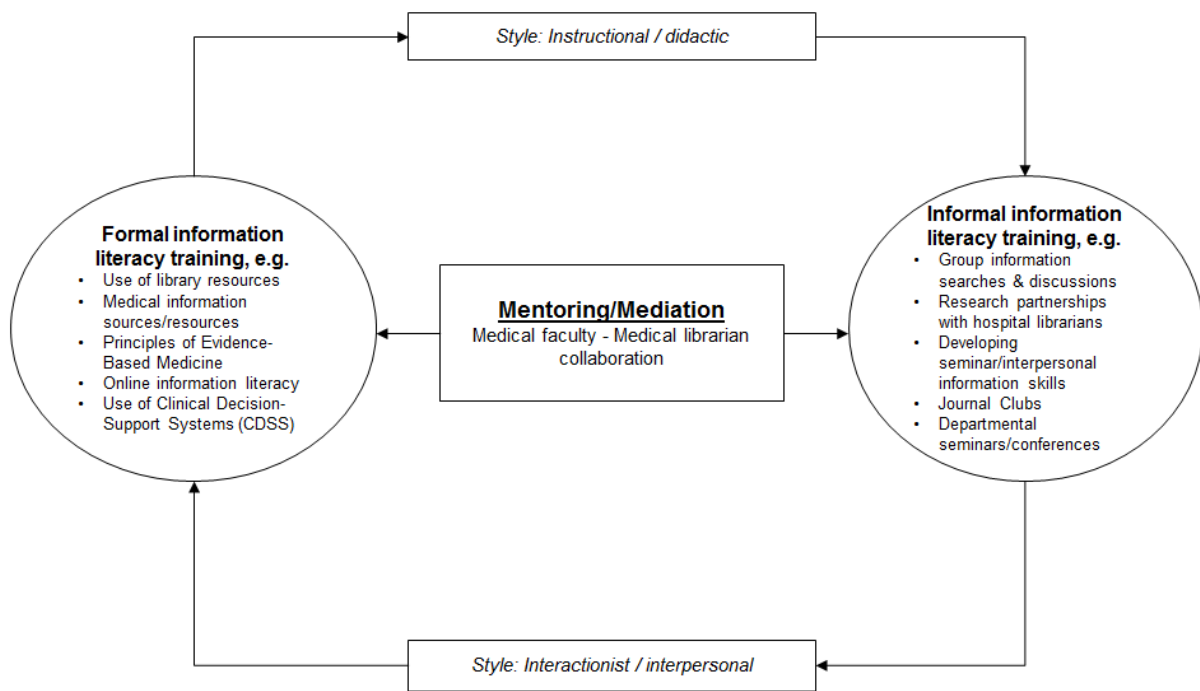
## **7.5 Recommendations**

The study makes the following recommendations based on the conclusions and the implications of the findings.

### **7.5.1 Enhancing the paediatricians' information literacy skills and practices**

First, it is recommended that ensuring uniformity of good information practice requires the implementation of systematic development of the paediatricians' information capabilities. For example, embedding uniform information literacy courses and non-formal information literacy training in the paediatric residency, is envisaged to have potentials for improving information practices of the clinicians.

The suggested components of this training aim at plugging the information literacy capability inadequacies identified through this study, which adversely affected the paediatricians' information practices. These components are as outlined in the ILST model of figure 49.



**Figure 49: Information Literacy Skills Training (ILST) Model for paediatricians in Nigeria**

The rationale for adopting the ILST model is that there is need for the modification of paediatric residency tuition in Nigeria to reflect changing global trends and engender better information capacity for the paediatricians. The training of paediatric residents requires placing more emphasis on clinicians’ development of information literacy capabilities in aid of the practice of evidence-based medicine.

It is envisaged that the ILST model fits into the information literacy training needs of health care professionals in different specialties. It is, therefore, recommended that the ILST model be adopted for the inculcation of information literacy skills to trainee and practicing physicians and healthcare givers in other specialties.

The practice identified in this study, where there was a top-down attribution of information authority based on seniority and practice experience, could be leveraged on for providing a more definite form of mentoring system for training junior paediatricians on information skills. A personalised, better structured form of mentoring appears plausible for maximising the potentials of this type of information practice in enhancing the information experiences and knowledge of the junior clinicians.

Mentoring, where the consultants played a greater role in training junior clinicians could become more formalised within the residency programme. This would enable better tuition,

information and knowledge sharing which could empower the junior clinicians with more knowledge and better clinical competence.

### **7.5.2 Information resources, services and infrastructure improvement**

Secondly, this study points to the required urgent attention in improving the information services rendered to clinicians at hospital libraries. It is therefore recommended that the hospital librarians to introduce innovative information services capable of supporting evidence-based practice such as facilitating research partnerships with the clinicians as the champions of information provision. Similarly, the rising popularity of point of care information practice among the paediatricians should encourage the hospital librarians to works towards providing embedded clinical medical librarian services to the clinical teams, towards a more effective information use at the point of care.

Additional to this is the need to provide better access to medical resources e.g. availability of e-library with adequate evidence-based resources at the point of care, is likely to lead to improved information practices and better quality patient care in general. The provision of e-library in places like wards and consulting rooms is very likely to attract a high rate of use since some of the clinicians also demanded for it themselves. Besides, the paediatricians are already favourably disposed towards point of care information use, and they utilise information at different points during a day's work at the hospital.

Thirdly, it is recommended that the hospital's management attaches priority in their budget to replacing the outdated information resources at the hospital library. This intervention appears urgent given the very dated state of the currently available materials. Upgrading the hospital library with current information materials is, therefore, a very pressing need which has the potential of eliminating clinician frustrations and possibly leading to increased use of the library.

Fourthly, it recommended that the implementation of a clinical decision support system (CDSS) at the hospital, and training of clinicians on its use, has become imperative. Implementing this will provide more reliable information support for the clinicians during critical patient care. This appears more pressing given the resident paediatricians' current practice of obtaining information from colleagues when handling critical incidents. Therefore, implementing a CDSS system for use in clinical care would likely circumvent the probability that the residents would obtain anecdotal information which human sources are prone to giving.



Additionally, it is recommended that since hand-held i-media devices such as iPads, smartphones and tablets were already being increasingly utilised by paediatricians at the point-of-care for access to real-time information, the hospital should provide these gadgets for official use. This is likely to improve the quality and effectiveness of paediatric patient care through clinicians' speedy access to medical information for quick decision making. Besides enhancing the effectiveness of patient care, it will remove the high cost of self-provision of the gadgets and resource subscription from the paediatricians.

Fifthly, it is recommended that the hospital's management work towards the provision of a reliable internet service for use by its health care staff as demanded by majority of interviewees. This service has potential usefulness for every clinician in accessing information, but for the paediatric residents specifically; it is useful not only for accessing information for patient care, but also in supporting their residency training. This is pertinent as the study found that inadequate and costly self-provision of internet services and e-resources prohibit physicians' access and use of medical information and because personal choices of information sources were influenced by ease of use, availability and affordability.

### **7.5.3 Hospital librarians re-training and appraisal of information services**

It is recommended that there is a need for the hospital librarians to improve on their professional skills through retraining in order to enable the delivery of better information service to the clinicians. This is urgent given the avalanche of negative comments by paediatricians querying the capacity and usefulness of the hospital librarians, based on experiences from their previous encounters.

This study recommends that the hospital librarians should re-assess the information service provided through the HINARI database in order to fully resolve the reasons that orchestrate its very poor use by the paediatricians.

### **7.5.4 Establishment of Journal Clubs**

The study recommends that the paediatricians mitigate the impact of the paucity of local medical resources, by establishing Journal clubs to foster research and increase available knowledge on rare ailments. It is recommended that the paediatricians do this in collaboration with their colleagues working at similar tropical contexts.

## **7.6 The Study Limitations**

The study recognizes the following limitations:

Data collected for the study was mainly through self-reports obtained from the interviews and diaries. Additional data were obtained from observations and online chats. It had to be assumed, that the researcher's presence did not introduce bias in the responses obtained from the interviews. The study takes into account the subjective nature of people's responses to social subjects in the data collected, and the probability that this subjectivity could have increased during the interviews.

The research was based on an in-depth case study of one tertiary hospital using the limited number of paediatricians working there. Owing to this limited number of participants and the dissimilarities in the conditions at the different levels of hospital service in Nigeria, the results cannot be generalizable. Results and interpretations from this study would largely mirror conditions at similar tertiary hospitals and could be transferable in understanding the information problems faced by paediatricians in those similar contexts.

## **7.7 Future Research**

Subsequent studies could use the understanding generated from this research to conduct a wider national survey that includes primary and secondary hospitals. This will be useful for determining the extent to which findings from this study apply generally to paediatricians working in different health care settings. This is necessary for assessing the overall impact of the information experiences and practices of paediatricians' across the healthcare institutions in Nigeria on the delivery of child healthcare.

Further studies could also assess the overall impact of local publishing on availability of medical resources and paediatricians information use towards the delivery of child healthcare in Nigeria.

Furthermore, a study of the policy framework, manpower and infrastructure requirement for implementing the ILST effectively in Nigerian Paediatric Residency programme is also imperative.

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## Appendices

### Appendix 1: Correspondence with the Head of the Pediatrics Department

Reply all | Delete Junk |

Re: Reminder on your participation in my research data collection

C chik4sco@yahoo.co.uk Reply all |  
01/08/2014  
Samuel Ibenne

It's my pleasure.  
Dr Ibeneme  
Sent from my BlackBerry wireless device from MTN

---

**From:** Samuel Ibenne <S.K.Ibenne@lboro.ac.uk>  
**Date:** Fri, 1 Aug 2014 11:50:39 +0000  
**To:** Ibeneme (chik4sco@yahoo.co.uk) <chik4sco@yahoo.co.uk>  
**Subject:** Reminder on your participation in my research data collection

Dear Dr Ibeneme,

You may recall that sometime in early May this year I asked for your email address to be used in contacting you further over participating in the data gathering process for my PhD research. I appreciate your kind gesture in obliging me on the request.

Be assured that in keeping with the ethical rules of research, that you will remain anonymous in the research report and your responses will be treated with utmost confidentiality and never divulged outside the purpose of the study. Also note that you are free to withdraw your consent in participating at any time or to withdraw any or part of the data you supply. You are equally free to request a transcript of your interview before or after research use.

At this point, we are still working out the details of the data collection process, but hopefully, I will be in Nigeria as from November into next year for the data collection activity. This first contact is only a reminder as I will inform you when the process will start and whatever else is necessary.

Best Wishes

Samuel Ibenne  
PhD Research Student  
Centre for Information Management  
School of Business and Economics  
Loughborough University  
Leicestershire  
United Kingdom

## Appendix 2: Ethical Approval Form

**Ethics Approvals (Human Participants) Sub-Committee**



### Ethical Clearance Checklist

Has the Investigator read the 'Guidance for completion of Ethical Clearance Checklist' before starting this form?	Yes
---	-----

**Project Details**

1. Project Title: Paediatric physicians' experience and practice of information literacy for child healthcare provision in Nigeria

**Applicant(s) Details**

2. Name of Applicant 1: Dr Janet Harrison and Dr Mark Hepworth	10. Name of Applicant 2: Samuel Kelechukwu Ibenne
3. Status: Staff	11. Status: PGR Student
4. School/Department: Centre for Information Management, School of Business and Economics	12. School/Department: Centre for Information Management, School of Business and Economics
5. Programme (if applicable): PhD Research	13. Programme (if applicable): PhD Research
6. Email address: J.Harrison@lboro.ac.uk; M.Hepworth@lboro.ac.uk	14. Email address: S.K.Ibenne@lboro.ac.uk
7a. Contact address: Centre for Information Management School of Business and Economics Sir Richard Morris Building Loughborough University Loughborough Leicestershire LE11 3TU	15a. Contact address: Centre for Information Management School of Business and Economics Sir Richard Morris Building Loughborough University Loughborough Leicestershire LE11 3TU
7b. Telephone number: Dr Janet Harrison: +44(0)1509223055; Dr Mark Hepworth: +44(0)1509223039	15b. Telephone number: +44(0)7440205507
8. Supervisor: Yes	16. Supervisor: No
9. Responsible Investigator: Yes	17. Responsible Investigator: Yes

**Participants**

### Positions of Authority

18. Are researchers in a position of direct authority with regard to participants (e.g. academic staff using student participants, sports coaches using his/her athletes in training)?	No
--	----

### Vulnerable groups

19. Will participants be knowingly recruited from one or more of the following vulnerable groups?	
Children under 18 years of age	No
Persons incapable of making an informed decision for themselves	No
Pregnant women	No
Prisoners/Detained persons	No
Other vulnerable group Please specify: Click here to enter text	No
<b>If you have selected No to all of Question 19, please go to Question 23.</b>	
20. Will participants be chaperoned by more than one investigator at all times?	Choose an item
21. Will at least one investigator of the same sex as the participant(s) be present throughout the investigation?	Choose an item
22. Will participants be visited at home?	Choose an item

### Researcher Safety

23. Will the researcher be alone with participants at any time?	Yes
<b>If Yes, please answer the following questions:</b>	
23a. Will the researcher inform anyone else of when they will be alone with participants?	Yes
23b. Has the researcher read the 'guidelines for lone working' and will abide by the recommendations within?	Yes

### Methodology and Procedures

24. Please indicate whether the proposed study:

Involves taking bodily samples (please refer to published guidelines)	No
Involves using samples previously collected with consent for further research	No

Involves procedures which are likely to cause physical, psychological, social or emotional distress to participants	No
Is designed to be challenging physically or psychologically in any way (includes any study involving physical exercise)	No
Exposes participants to risks or distress greater than those encountered in their normal lifestyle	No
Involves collection of body secretions by invasive methods	No
Prescribes intake of compounds additional to daily diet or other dietary manipulation/supplementation	No
Involves pharmaceutical drugs	No
Involves use of radiation	No
Involves use of hazardous materials	No
Assists/alters the process of conception in any way	No
Involves methods of contraception	No
Involves genetic engineering	No

Involves testing new equipment	No
--------------------------------	----

#### Observation/Recording

25a. Does the study involve observation and/or recording of participants? If Yes:	Yes
25b. Will those being observed and/or recorded be informed that the observation and/or recording will take place?	Yes

#### Consent and Deception

26. Will participants give informed consent freely?	Yes
---	-----

#### Informed consent

27. Will participants be fully informed of the objectives of the study and all details disclosed (preferably at the start of the study but, where this would interfere with the study, at the end)?	Yes
28. Will participants be fully informed of the use of the data collected (including, where applicable, any intellectual property arising from the research)?	Yes

29. For children under the age of 18 or participants who are incapable of making an informed decision for themselves:	
a. Will consent be obtained (either in writing or by some other means)?	N/A
b. Will consent be obtained from parents or other suitable person?	N/A

c. Will they be informed that they have the right to withdraw regardless of parental/guardian consent?	N/A
d. For studies conducted in schools, will approval be gained in advance from the Head-teacher and/or the Director of Education of the appropriate Local Education Authority?	N/A
e. For detained persons, members of the armed forces, employees, students and other persons judged to be under duress, will care be taken over gaining freely informed consent?	N/A

#### Deception

30. Does the study involve deception of participants (i.e. withholding of information or the misleading of participants) which could potentially harm or exploit participants?	No
If Yes:	
31. Is deception an unavoidable part of the study?	Choose an item
32. Will participants be de-briefed and the true object of the research revealed at the earliest stage upon completion of the study?	Choose an item
33. Has consideration been given on the way that participants will react to the withholding of information or deliberate deception?	Choose an item

#### Withdrawal

34. Will participants be informed of their right to withdraw from the investigation at any time and to require their own data to be destroyed?	Yes
--	-----

#### Storage of Data and Confidentiality

35. Will all information on participants be treated as confidential and not identifiable unless agreed otherwise in advance, and subject to the requirements of law?	Yes
36. Will storage of data comply with the Data Protection Act 1998?	Yes
37. Will any video/audio recording of participants be kept in a secure place and not released for any use by third parties?	Yes
38. Will video/audio recordings be destroyed within ten years of the completion of the investigation?	Yes
39. Will full details regarding the storage and disposal of any human tissue samples be communicated to the participants?	N/A
40. Will research involve the sharing of data or confidential information beyond the initial consent given?	No
41. Will the research involve administrative or secure data that requires permission from the appropriate authorities before	No

use?	
------	--

### Incentives

42. Will incentives be offered to the investigator to conduct the study?	No
43. Will incentives be offered to potential participants as an inducement to participate in the study?	No

### Work Outside of the United Kingdom

44. Is your research being conducted outside of the United Kingdom?	Yes
<b>If Yes:</b>	
45. Has a risk assessment been carried out to ensure the safety of the researcher whilst working outside of the United Kingdom?	Yes
46. Have you considered the appropriateness of your research in the country you are travelling to?	Yes
47. Is there an increased risk to yourself or the participants in your research study?	No
48. Have you obtained any necessary ethical permission needed in the country you are travelling to?	Yes

### Information and Declarations

#### Checklist Application Only:

If you have completed the checklist to the best of your knowledge, and not selected any answers marked with an \* or †, your investigation is deemed to conform with the ethical checkpoints. Please sign the declaration and lodge the completed checklist with your Head of Department/School or his/her nominee.

#### Checklist with Additional Information to the Secretary:

If you have completed the checklist and have only selected answers which require additional information to be submitted with the checklist (indicated by a †), please ensure that all the information is provided in detail below and send this signed checklist to the Secretary of the Sub-Committee.

#### Checklist with Generic Protocols Included:

If you have completed the checklist and you have selected one or more answers in which you wish to use a Generic Protocol (indicated by #), please include the Generic Protocol reference number in the space below, along with a brief summary of how it will be used. Please ensure you are on the list of approved investigators for the Generic Protocol before including it on the checklist. The completed checklist should be lodged with your Head of



Department/School or his/her nominee.

**Full Application needed:**  
If on completion of the checklist you have selected one or more answers which require the submission of a full proposal (indicated by a \*), please download the relevant form from the Sub-Committee's web page. **A signed copy of this Checklist should accompany the full submission to the Sub-Committee.**

**Space for Information on Generic Proposals and/or Additional Information as requested:**

**For completion by Supervisor**

Please tick the appropriate boxes. The study should not begin until all boxes are ticked.

- The student has read the University's Code of Practice on investigations involving human participants
- The topic merits further research
- The student has the skills to carry out the research or are being trained in the requires skills by the Supervisor
- The participant information sheet or leaflet is appropriate
- The procedures for recruitment and obtaining informed consent are appropriate

Comments from supervisor:

Signature of Applicant: Samuel Ibenne



Signature of Supervisor (if applicable):



Signature of Head of School/Department or his/her nominee:



Date: 30<sup>th</sup> September, 2014

## Appendix 3: Participant Informed Consent Form



Insert Name of Research Proposal

### **INFORMED CONSENT FORM** (to be completed after Participant Information Sheet has been read)

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the Loughborough University Ethical Approvals (Human Participants) Sub-Committee.

I have read and understood the information sheet and this consent form.

I have had an opportunity to ask questions about my participation.

I understand that I am under no obligation to take part in the study.

I understand that I have the right to withdraw from this study at any stage for any reason, and that I will not be required to explain my reasons for withdrawing.

I understand that all the information I provide will be treated in strict confidence and will be kept anonymous and confidential to the researchers unless (under the statutory obligations of the agencies which the researchers are working with), it is judged that confidentiality will have to be breached for the safety of the participant or others.

I agree to participate in this study.

Your name

---

Your signature

---

Signature of investigator

---

Date

---

## Appendix 4: Semi-structured oral interview guide

INTERVIEW QUESTIONS	
1	<p>If I asked you to reflect on the education you received leading up to your medical qualification; can you describe specific trainings you received on your developing capacity for obtaining and using information?</p> <p>Reflecting back to your medical school days specifically, can you narrate trainings that focused on accessing and using medical information?</p>
2	<p>Can you tell me your view about information use in patient care?</p> <p>How would you describe your information needs within the context of your role as a paediatrician?</p>
3	<p>In your opinion, does information play any role in patient care?</p> <p>Describe how information has contributed to caring for your patients</p> <p>What impression do you have about accessing information for use at the point of care?</p>
4	<p>When you need medical information in caring for a patient, what do you generally do?</p> <p>How often do you need medical information in managing your patients?</p> <p>Can you remember a critical situation over the past few months when you needed information in managing a patient?</p> <ul style="list-style-type: none"> <li>• What led up to that situation?</li> <li>• What did you do to get the information?</li> <li>• How did you use that information?</li> <li>• What happened after you used the information?</li> <li>• What helped the process?</li> <li>• What hindered?</li> </ul>
5	<p>What sources do you normally use for meeting your medical information needs?</p> <p>Why do you use these sources?</p>
6	<p>Can you tell me the activities you engage in to keep yourself up to date as a paediatric physician?</p> <ul style="list-style-type: none"> <li>• What helps you in the process?</li> <li>• What hinders the process?</li> </ul> <p>Narrate how you think this impacts on your practice</p>
7	<p>Can you narrate the ways you have noticed your fellow paediatric physicians in this hospital use in keeping up to date?</p> <ul style="list-style-type: none"> <li>• What help or support is available for people in keeping up to date?</li> <li>• Are there any systems/services that help with your information needs?</li> </ul> <p>Describe any other means that afford you medical information or additional knowledge in support of your work as a paediatric physician</p> <p>If I asked you to reflect on colleagues' capacity to access and use information in their work, do you think people differ?</p> <ul style="list-style-type: none"> <li>• Does this impact on peoples practice?</li> </ul>
8	<p>Where would you place the hospital librarians within your role as a paediatric physician?</p> <ul style="list-style-type: none"> <li>• Can you narrate how often you have received assistance from the hospital librarians over your medical information needs?</li> <li>• Is there a situation where the information made a significant difference?</li> </ul> <p>If I may ask you a personal question; what aspects of your ability to access and use information do you feel is particularly good?</p> <p>What areas would you think could be improved or enhanced?</p>
9	<p>What in your view promotes or inhibits your capacity and that of your colleagues in this hospital from accessing and using medical information?</p> <ul style="list-style-type: none"> <li>• Are there actions you and your colleagues could take to address this?</li> <li>• What do you think the hospital could do to address this?</li> </ul>

Appendix 5: Participant Diary Schedule  
**Participant informant diary of information activities**

Your diary entry is expected to provide the following:

- Description of activity, programme etc. you performed or participated in, which provided information either for yourself or for your colleagues on the day you log the diary
- Where you went or what you consulted for the information
- What you wanted to know (reason for engaging in the information activity)
- Whether you received the information you needed
- In what way(s) the information was useful (i.e. to your work role or your person where more appropriate)
- Description of any barriers or challenges you encountered and how you resolved them

**Important notes**

1. Writing the date at the top of the page for each log day is important
2. Your log is best done immediately after the activity, up till end of your day's activities (including at home), provided your log is for the same day
3. Participation is optional and anonymity is guaranteed
4. Be as detailed as possible

<b>Date:</b>			
<b>Information activities/sources consulted</b>	<b>Reason(s) for information activity/consulting sources</b>	<b>Was information obtained and how was it useful?</b>	<b>Describe any challenges you encountered and the solution(s)</b>

Appendix 6: Records from participant diaries

**Table 17: Day one information activity diary entry for participant 1**

<b>Day 1 – Thursday (Participant 1) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ol style="list-style-type: none"> <li>1. Nelson textbook of paediatrics</li> <li>2. Forfar and Arneils textbook of paediatrics</li> <li>3. MEDSCAPE</li> <li>4. American Journal of paediatrics</li> <li>5. Medical library</li> </ol>
Reason for information activity / consulting the sources	Information on muscular dystrophy incidences and prevalence in Nigeria and diagnostic modalities.
Was needed information obtained?	Information needed was received although the journals consulted did not have much on the epidemiology
How useful was the information? (to the physician's work role or person where more appropriate)	The information was useful in the management of our patients
Any challenges / barriers encountered and how it was resolved	Most journals consulted could only give access to the abstract. You had to pay to have the full work.

**Table 18: Day one information activity diary entry for participant 2**

<b>Day 1 – Wednesday (Participant 2) Senior Registrar</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Had clinical meeting in the department – A forum for health workers (House Officers, Residents, Consultants, Nurses) to have an in-depth look on a clinical problem. A unit presentation of the topic “MUSCULAR DYSTROPHY” was carried out and opportunity provided for questions and clarification.</li> <li>• To participate in the discussion, I reviewed literature from the internet</li> </ul>
Reason for information activity / consulting the sources	I sought information regarding the gastric basis of the disease and if there are trends in management.
Was needed information obtained?	I succeeded in receiving considerable information, though mostly on literatures from Europe and America.

How useful was the information? (to the physician's work role or person where more appropriate)	Information was helpful because it provided basis for further research. It also provided information on better patient management.
Any challenges / barriers encountered and how it was resolved	Problems I encountered included – paucity of data and poor network for browsing the internet; Erratic power supply.

**Table 19: Day one information activity diary entry for participant 3**

<b>Day 1- Monday – (Participant 3) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Had a Consultant's ward round – we had a child with Nephritic Syndrome and then Mumps. We had to consult the internet to see if there was any documented relationship and what better form of management we might give.</li> <li>• Also same day we were faced with a patient with multiple digit abscesses and severe anemic but mother was financially handicapped to provide requested drugs and blood transfusion. We drew from the knowledge of the Consultant who contacted the social welfare department with a view to “pauperising” the child and hopefully we can get what we need to treat the child</li> <li>• Also at several times in the ward round we had to consult the drug formulary for precise dosing of some medications we needed to prescribe.</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	The various studies seen were mostly case reports from various clinicians.
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 20: Day one information activity diary entry for participant 4**

<b>Day 1 – Wednesday (Participant 4) Consultant</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Group review of a departmental presentation of acute asthma exacerbation management (pre-presentation).</li> <li>• Summarised the presentation to the audience after the presentation and also answered some of the questions asked.</li> <li>• Information was sought from textbooks and the internet</li> </ul>
Reason for information activity / consulting the sources	To get the latest information on asthma management in children.
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	Information gotten gave me a wider option of opinions on asthma treatment.
Any challenges / barriers encountered and how it was resolved	

**Table 21: Day one information activity diary entry for participant 5**

<b>Day 1 – Monday (Participant 5) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• During a discussion class, I needed information on the standard definition of the various forms of relapse in nephritic syndrome.</li> <li>• Consulted Nelson's textbook of paediatrics.</li> <li>• Kidney Disease, Improving Global Outcome (KDIGO) guidelines via Google.</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	Updated my knowledge of the dosage and pharmacokinetics of the drug Baclofen (during a routine ward round) by consulting BNF (British National Formulary).
How useful was the information? (to the physician's work role or person where more appropriate)	This enabled me make a prescription for my patient



Any challenges / barriers encountered and how it was resolved	
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**Table 22: Day one information activity diary entry for participant 6**

<b>Day 1 – Tuesday (Participant 6) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Patient treatment / management, ward round with consultant. Teaching house officers.</li> <li>• Nelson textbook of paediatrics, BNF Drug Formulary</li> </ul>
Reason for information activity / consulting the sources	To verify method of vaginal examination in paediatric patients and to verify the dosage of Metoclopramide
Was needed information obtained?	Information sought were received
How useful was the information? (to the physician's work role or person where more appropriate)	Appropriate dosing of Metoclopramide, better assessment of a female girl with suspected genital infection.
Any challenges / barriers encountered and how it was resolved	None

**Table 23: Day one information activity diary entry for participant 7**

<b>Day 1 – Monday Participant 7) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Monday morning review – Review of most critical case in children emergency unit</li> <li>• Consulted in the out-patient clinic till 4 pm.</li> </ul>
Reason for information activity / consulting the sources	To know what has been done so far for the patient.
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	Additional prompt treatment added to patient management.
Any challenges / barriers encountered and how it was resolved	

**Table 24: Day two information activity diary entry for participant 1**

<b>Day 2 – Friday (Participant 1) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Unit consultant ward round.</li> <li>• Medscape, Medline and textbooks were consulted.</li> </ul>
Reason for information activity / consulting the sources	Current management of acute severe malnutrition.
Was needed information obtained?	<ul style="list-style-type: none"> <li>• The information sought was gotten</li> <li>• Most of the studies were from sub-Saharan Africa since the afore-mentioned topic seemed not very common in the western world.</li> </ul>
How useful was the information? (to the physician's work role or person where more appropriate)	It helped in better and wholistic management of the patient.
Any challenges / barriers encountered and how it was resolved	

**Table 25: Day two information activity diary entry for participant 2**

<b>Day 2 – Thursday (Participant 2) Senior Registrar</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• I was involved today in a postgraduate interaction. An exclusive interaction for resident doctors in training. Topics relevant to our college exams are discussed in an interactive session.</li> <li>• I made use of the internet. I also had to consult other textbooks in our library.</li> </ul>
Reason for information activity / consulting the sources	My aim was to access information on the topic acute kidney injury. I made effort to access the etiology and current classification methods.
Was needed information obtained?	I succeeded in getting the information I needed mostly through the internet as most of the textbooks in our hospital library are outdated.
How useful was the information? (to the physician's work role or person)	We got to know the current classification methods of AKI, the diverse etiologies, and that prevention is actually the best

where more appropriate)	treatment method.
Any challenges / barriers encountered and how it was resolved	Problem I encountered included the fact that most textbooks I consulted in our library were old / outdated and needed replacement.

**Table 26: Day two information activity diary entry for participant 3**

<b>Day 2 – Wednesday (Participant 3) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	I ran the children outpatient unit and did see several cases. Saw a case of multiple painless, itchy rashes on the scrotal sac and tip of the penis of a 10yr old boy. I discussed this with the other members of the unit with a view to developing a management plan. We then later referred to the Dermatology clinic, but to also see us at a later date so we can get the input of the Dermatologist.  Also attended a departmental clinical meeting where management of acute exacerbation of asthma was discussed with various sources cited.
Reason for information activity / consulting the sources	
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 27: Day two information activity diary entry for participant 4**

<b>Day 2 – Friday (Participant 4) Consultant</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	Read up management of patent ductus arteriosus PDA in newborn in Medscape and textbook (Nelson textbook of paediatrics). Discussed with the unit at the ward round in newborn unit.
Reason for information activity / consulting the sources	<ul style="list-style-type: none"> <li>• Present management including natural course of PDA</li> <li>• The place of IV fluid as a possible event leading up to “opening” of PDA.</li> </ul>

Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 28: Day two information activity diary entry for participant 5**

<b>Day 2 – Tuesday (Participant 5) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Settled an argument with a colleague concerning adolescent health (characteristic changes during puberty in males) by consulting Nelson's textbook of paediatrics, and Medscape (Web search).</li> <li>• Had a discussion class – aimed at solving a number of past questions of the West African College of physicians (Part 1).</li> <li>• Had to rely almost entirely on nelson textbook of paediatrics, Ganong textbook of physiology and Robbin's basic pathology.</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	Terrible network

**Table 29: Day two information activity diary entry for participant 6**

<b>Day 2 – Sunday (Participant 6) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Preparation for a seminar presentation (Power Point).</li> <li>• Information sources: Biostatistics textbook, slide share,</li> </ul>

	USMLE questions.
Reason for information activity / consulting the sources	To source information on the basic principles of statistics
Was needed information obtained?	Most of the information sought were found
How useful was the information? (to the physician's work role or person where more appropriate)	They helped to enrich my knowledge in statistics and to prepare power point presentation
Any challenges / barriers encountered and how it was resolved	Occasional network (cyber) delays

**Table 30: Day two information activity diary for participant 7**

<b>Day 2 – Tuesday (Participant 7) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Tuesday paediatric cardiology clinic</li> <li>• Consulted eMedicine and other journals on current management of such cases.</li> </ul>
Reason for information activity / consulting the sources	<ul style="list-style-type: none"> <li>• Ventricular septal defect in heart failure in a 4 month old patient</li> </ul>
Was needed information obtained?	Information on this heart failure was well received
How useful was the information? (to the physician's work role or person where more appropriate)	Review of the cardiology cases on follow up.
Any challenges / barriers encountered and how it was resolved	Patient's relatives were unable to pay for the investigations and medications. Social welfare was brought in and the cost subsidized.

**Table 31: Day three information activity diary entry for participant 1**

<b>Day 3 – Monday (Participant 1) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>

Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Group academic discussions</li> <li>• Textbooks, Medscape, HINARI, LANCET.</li> </ul>
Reason for information activity / consulting the sources	Paediatrics.
Was needed information obtained?	Information needed was received
How useful was the information? (to the physician's work role or person where more appropriate)	The information received helped in enriching my wealth of knowledge
Any challenges / barriers encountered and how it was resolved	None.

**Table 32: Day three information activity diary entry for participant 2**

<b>Day 3 – Friday (Participant 2) Senior Registrar</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Today I was involved in our mortality review. It provided a forum where case notes of deceased patients are analysed / summarized with the aim of finding ways of making future treatment better. I actually summarized a case of acute leukaemia who died after about 1 week on admission.</li> <li>• I consulted literatures in our current textbooks and also used the internet.</li> </ul>
Reason for information activity / consulting the sources	I needed information on factors that affect the outcome in patient who have acute leukaemia and causes of death. Inasmuch as leukaemia is not common in blacks as compared to Caucasian it is still a major cause of mortality in Nigeria.
Was needed information obtained?	I also got to find out other factors that affect progress / outcome in blacks.
How useful was the information? (to the physician's work role or person where more appropriate)	I also got information on modalities that may be used to prolong life.
Any challenges / barriers encountered and how it was resolved	I was able to get much information I needed and did not encounter significant problems.

**Table 33: Day three information activity diary entry for participant 3**

<b>Day 3 Thursday (Participant 3) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• I ran a pediatric nephrology specialist clinic in conjunction with the unit consultant.</li> <li>• We saw a case of periorbital fullness only for 3/12 but with urine sap protein of [not clear]. Since it was not usual to have a nephritic range proteinuria with just periorbital fullness and no pedal fullness; we embarked into a search.</li> <li>• Went online to check for similar case and saw a few case reports, we also called senior colleagues in the field of paediatric nephrology practicing at other centres in the country to get their opinion.</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	From our search and clinical acumen we investigated the child along the line of Nephritic syndrome to make a definite diagnosis.
Any challenges / barriers encountered and how it was resolved	

**Table 34: Day three information activity diary entry for participant 4**

<b>Day 3 – Monday (Participant 4) Consultant</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Read up hypoglycaemia online.</li> <li>• Discussed at the rounds in newborn unit.</li> </ul>
Reason for information activity / consulting the sources	To compare the definitions
Was needed information obtained?	Required information was gotten
How useful was the information? (to the physician's work role or person where more appropriate)	Information helped in clarifying different definitions of From our search and clinical acumen we investigated the child along the line of hypoglycaemia.
Any challenges / barriers encountered and how it was resolved	

**Table 35: Day three information activity diary entry for participant 5**

<b>Day 3 – Wednesday (Participant 5) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Did a personal reading (exam preparation) and covered general aspects of sickle cell anaemia and thalassemia syndromes</li> <li>• Nelson textbook of paediatrics and Essential Haematology by Hoffbrand, Petit and Moss.</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	Fulfilling day.
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 36: Day three information activity diary entry for participant 6**

<b>Day 3 – Tuesday (Participant 6) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Ward round with consultant, patient management.</li> <li>• Information sources: colleagues, consultant, E-medicine.</li> </ul>
Reason for information activity / consulting the sources	To get information concerning types of stridor and treatment based on whether upper airway is involved or not
Was needed information obtained?	Information was obtained.
How useful was the information? (to the physician's work role or person where more appropriate)	Knowledge was gained for better management of patient in future
Any challenges / barriers encountered and how it was resolved	Some colleagues consulted were not very sure of the answers sought.



**Table 37: Day three information activity diary entry for participant 7**

<b>Day 3 – Wednesday (Participant 7) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Wednesday consultants ward rounds.</li> <li>• A review of the paediatric cases under my consultant in the ward.</li> <li>• Clinical seminar – acute kidney injury</li> <li>• Used Medscape and other IT sites to source for information.</li> </ul>
Reason for information activity / consulting the sources	Wanted to find out any new trends in management of acute kidney injury.
Was needed information obtained?	Got useful information ... [see box below].
How useful was the information? (to the physician's work role or person where more appropriate)	Got useful information which aided in better management of children with acute kidney injury.
Any challenges / barriers encountered and how it was resolved	

**Table 38: Day four information activity diary entry for participant 1**

<b>Day 4 – Tuesday (Participant 1) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Postgraduate seminar</li> <li>• Medical textbooks, medical library. AJOL, Medscape, Wikipedia</li> </ul>
Reason for information activity / consulting the sources	Information on Haemophilia.
Was needed information obtained?	The information needed was received
How useful was the information? (to the physician's work role or person where more appropriate)	The information gathered helped in widening our understanding of the topic.
Any challenges / barriers encountered and how it was resolved	No barrier was encountered.

**Table 39: Day four information activity diary entry for participant 2**

<b>Day 4 – Tuesday (Participant 2) Senior Registrar</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Did a personal reading and literature review with respect to one of my proposed research topic – factors affecting prognosis in patients with respiratory infection admitted in our emergency unit.</li> <li>• I consulted journals and books on the works on similar topics by other authors. I used the departmental library, hospital library and the internet via my tablet.</li> </ul>
Reason for information activity / consulting the sources	I needed to find out the factors that affect outcome in patients with RI admitted in emergency unit and how these ... [entry not clear].
Was needed information obtained?	I succeeded in getting most of the information I needed... [See continuation in box below].
How useful was the information? (to the physician's work role or person where more appropriate)	[...] that went a long way in forming the specific targets of my own topic. Information gotten was also helpful in possibly forming policies at the departmental level for better patient management in emergency units.
Any challenges / barriers encountered and how it was resolved	I didn't encounter significant problems today.

**Table 40: Day four information activity diary entry for participant 3**

<b>Day 4 – Friday (Participant 3) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• I conducted my ward round saw an 11 year old who had had a bilateral renal angle pain for over 3 months with...[entry not clear].</li> </ul>
Reason for information activity / consulting the sources	While I pondered over the admitting diagnosis of chronic bilateral pyelonephritis, the challenge for me was why they were presenting this late. Also same day saw a boy of 5 years old with Obstructive Uropathy possibly due to posterior urethral valve with Urosepsis. Once again the late recognition and presentation of this case got me worried.
Was needed information obtained?	

How useful was the information? (to the physician's work role or person where more appropriate)	This has led me to currently mount a search of the reasons for late presentation and practical ways I can adopt within my community to limit it.
Any challenges / barriers encountered and how it was resolved	

**Table 41: Day four information activity diary entry for participant 4**

<b>Day 4 – Wednesday (Participant 4) Consultant</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	Internet search on ... [not clear] muscular dystrophy.
Reason for information activity / consulting the sources	In preparation for clinical conference by another unit (unit 2).
Was needed information obtained?	Got the information needed
How useful was the information? (to the physician's work role or person where more appropriate)	The information was useful to my person and would help in treatment of any future case.
Any challenges / barriers encountered and how it was resolved	Abnormally slow internet access due to poor network strength

**Table 42: Day four information activity diary entry for participant 5**

<b>Day 4 – Thursday (Participant 5) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>Updated my knowledge of Wiskett-Aldreich Syndrome (personal reading).</li> <li>Consulted Medscape to clarify the immune derangements associated with the syndrome.</li> <li>Searched the Web via Google for possible centres in this country where a patient could get a tattoo removed by laser... [See box below].</li> </ul>
Reason for information activity / consulting the sources	(Information needed by a patient) [in reference to bullet point three above].
Was needed information obtained?	
How useful was the information? (to the physician's work role or person	

where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 43: Day four information activity diary entry for participant 6**

<b>Day 4 – Monday (Participant 6) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Ward round and consultation services at Children emergency Room, plus preparation for a clinical presentation (power point).</li> <li>• Information sources: Internet, Biostatistics – a practical Approach to Research and Data handling (Textbook).</li> </ul>
Reason for information activity / consulting the sources	To get information on patient care and for basic principles of biostatistics and research.
Was needed information obtained?	Most of the information sought were got.
How useful was the information? (to the physician’s work role or person where more appropriate)	The power point presentation was very informative and educative both for me and other doctors who are currently undertaking their research projects.
Any challenges / barriers encountered and how it was resolved	Internet connectivity was sparse. There was little time to source more information because of pressure at work (Emergency room).

**Table 44: Day four information activity diary entry for participant 7**

<b>Day 4 – Thursday (Participant 7) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Thursday Senior Registrars Ward round.</li> <li>• Review of the cases in the ward</li> <li>• Study in the library on my research topic, used the internet.</li> </ul>
Reason for information activity / consulting the sources	To get information on patient care and for basic principles of biostatistics and research.
Was needed information obtained?	Was able to get the information I needed.
How useful was the information? (to the physician’s work role or person where more appropriate)	

Any challenges / barriers encountered and how it was resolved	Unable to get into some sites, had to pay before retrieving information from certain sites.
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**Table 45: Day five information activity diary entry for participant 1**

<b>Day 5 – Wednesday (Participant 1) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Personal reading.</li> <li>• Medical textbooks, Medscape and Wikipedia</li> </ul>
Reason for information activity / consulting the sources	Information on management of birth Asphyxia.
Was needed information obtained?	The information needed was received.
How useful was the information? (to the physician’s work role or person where more appropriate)	The information received helped in enriching my knowledge on current trends in management of Birth Asphyxia
Any challenges / barriers encountered and how it was resolved	No challenge was encountered.

**Table 46: Day five information activity diary entry for participant 2**

<b>Day 5 – Sunday (Participant 2) Senior Registrar</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• I moderated a group discussion as a Senior Registrar, involving house officers and junior residents within the hospital premises. Past essay and multiple choice questions were brought up for discussion. Participants used their tablets and laptops to assess information from the internet. A few had their “bulky” textbooks.</li> </ul>
Reason for information activity / consulting the sources	Aim was to prepare younger colleagues for upcoming professional exams.
Was needed information obtained?	Assessing information was a bit easier since this was a group discussion and a good number of us had internet access on our tablets / laptops.
How useful was the information? (to the physician’s work role or person where more appropriate)	Information sought included those relevant for our exams and we succeeded in getting as much as we needed and as much as our discussion time permitted.
Any challenges / barriers encountered	Power supply was an issue for some of us as this was on a

and how it was resolved	weekend and there was no power in the hospital as at that time. Aside that, it was a fruitful discussion.
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**Table 47: Day five information activity diary entry for participant 3**

<b>Day 5 – Thursday (Participant 3) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	A younger colleague approached me on a case of terminal hematuria in a 14 year old boy whom she rightly made a clinical diagnosis of Schistosomiasis and sent him to do a urine microscopy.
Reason for information activity / consulting the sources	The urine microscopy result came out revealing nothing and that was why she was consulting with me.
Was needed information obtained?	After going through the clinical scenario together: child swims, having dysuria and terminal hematuria; I had a look at the lab form that was filled for the urine microscopy and realised it was poorly filled out especially as regards the clinical history that would have helped the laboratory scientist.
How useful was the information? (to the physician's work role or person where more appropriate)	We both agreed the diagnosis was still schistosomiasis, but that a repeat urine microscopy will be done in the research lab. This sample result came out with classical pictures of ova with a terminal spine typical for <i>S. haematobium</i> . Patient has been commenced on Praziquantel and will be seen in a week's time.
Any challenges / barriers encountered and how it was resolved	

**Table 48: Day five information activity diary entry for participant 4**

<b>Day 5 – Thursday (Participant 4) Consultant</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	Researched on current diagnosis (criteria) for perinatal Asphyxia. Information from both internet and textbook
Reason for information activity / consulting the sources	Needed more information to help guide a colleague doing a work on asphyxia.
Was needed information obtained?	A very rewarding search and also discussed with the colleague.
How useful was the information? (to the physician's work role or person where more appropriate)	

Any challenges / barriers encountered and how it was resolved	
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**Table 49: Day five information activity diary entry for participant 5**

<b>Day 5 – Friday (Participant 5) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>Downloaded the current KDIGO guideline for managing of acute kidney injury (AKI).</li> <li>Had a discussion class with colleagues where several information was sought via PubMed, Medscape and Web MD concerning various general topics in paediatrics... [see box below].</li> </ul>
Reason for information activity / consulting the sources	...aimed at solving several multiple choice questions in WAEP (West African College of Physicians) part I examination.
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 50: Day five information activity diary entry for participant 6**

<b>Day 5 – Friday (Participant 6) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>Activity: Ward Round, mortality review meeting, outpatient and in-patient care / consultation.</li> <li>Information sources: Internet, textbook of paediatrics, consultants.</li> </ul>
Reason for information activity / consulting the sources	To get information that will explain the indices obtained in the management of the diseased patient and to find out what could have been done to save the life.
Was needed information obtained?	Information sought were largely found
How useful was the information? (to the physician's work role or person where more appropriate)	We were more armed with information for treatment of similar cases in future

Any challenges / barriers encountered and how it was resolved	Little if any
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**Table 51: Day five information activity diary entry for participant 7**

<b>Day 5 – Friday (Participant 7) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Weekly mortality review meeting</li> <li>• A review of the mortalities encountered in the department over a one week period</li> <li>• Ward rounds</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 52: Day six information activity diary entry for participant 1**

<b>Day 6 – Thursday (Participant 1) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Personal reading</li> <li>• Medical textbooks, Medscape, Medline, medical library.</li> </ul>
Reason for information activity / consulting the sources	Current management and diagnosis of Bronchial Asthma
Was needed information obtained?	Information needed was received
How useful was the information? (to the physician's work role or person where more appropriate)	The information received helped in better management of patients
Any challenges / barriers encountered and how it was resolved	No barrier was encountered



**Table 53: Day six information activity diary entry for participant 2**

<b>Day 6 – Monday (Participant 2) Senior Registrar</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>We had our unit's weekly ward round today, led by the unit consultant. Patients' history and current management were discussed by members of the unit – house officers, registrars, and senior registrars. Information were basically evidence based information as regards best practices in medicine.</li> <li>Information were basically from senior colleagues, mainly the unit consultant.</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	Advice were given to other members of the unit on best practices in nephrology, another specialty where prevention is better than actual treatment of renal diseases.
How useful was the information? (to the physician's work role or person where more appropriate)	Information provided were applied to the management of the patients we have in the ward. We also learnt that counselling patients / relations on prevention measures is paramount especially in our setting where renal replacement is hard to come by. I also did a personal information search / literature review to supplement what I've already learnt during the day.
Any challenges / barriers encountered and how it was resolved	

**Table 54: Day six information activity diary entry for participant 3**

<b>Day 6 – Monday (Participant 3) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	I had a consultant's ward round and saw a 2year old child with right empyema thoraces secondary to a poorly treated lobar pneumonia. He was already on continuous thoracotomy tube drainage but the challenge for us was, why lobar pneumonia at such a young age.
Reason for information activity / consulting the sources	
Was needed information obtained?	

How useful was the information? (to the physician's work role or person where more appropriate)	Questions were asked about the nutrition and routine immunisations and these were to help unravel the underlying pathology.
Any challenges / barriers encountered and how it was resolved	

**Table 55: Day six information activity diary entry for participant 4**

<b>Day 6 – Friday (Participant 4) Consultant</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Took part in a mortality audit</li> <li>• Had to check out some issues on pneumonia and heart failure after the audit meeting</li> <li>• Information was sought online</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	Some questions not answered
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 56: Day six information activity diary entry for participant 5**

<b>Day 6 – Saturday (Participant 5) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	Updated my knowledge of type I Diabetes mellitus (Nelson textbook of paediatrics and Medscape).
Reason for information activity / consulting the sources	
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 57: Day six information activity diary entry for participant 6**

<b>Day 6 – Saturday (Participant 6) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Activity: Ward round and consultations for patient care at Children Emergency Room.</li> <li>• Information source: From colleagues, consultants, Medscape, Drug Reference, BNF, online E-Medicine.</li> </ul>
Reason for information activity / consulting the sources	To verify drug dosages, indications and plan of management for specific ailments
Was needed information obtained?	Some colleagues contacted on phone were reached who gave useful guide. Book search was fruitful.
How useful was the information? (to the physician's work role or person where more appropriate)	Prompt actions were taken accordingly with regard to emergency cases being encountered with good results.
Any challenges / barriers encountered and how it was resolved	Some colleagues had to be reached on phone only, and were not reached when the information was needed.

**Table 58: Day six information activity diary entry for participant 7**

<b>Day 6 – Saturday (Participant 7) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Saturday weekend call</li> <li>• Reviewed all the cases in the ward</li> <li>• Continued my research work.</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	
Any challenges / barriers encountered and how it was resolved	

**Table 59: Day seven information activity diary entry for participant 1**

<b>Day 7 – Friday (Participant 1) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Medical textbooks, medical library</li> </ul>
Reason for information activity / consulting the sources	Causes of Rickets in the tropics
Was needed information obtained?	Information needed was received
How useful was the information? (to the physician's work role or person where more appropriate)	The information helped in understanding the discrepancy in causes of rickets in the tropics and western world
Any challenges / barriers encountered and how it was resolved	No challenge was encountered

**Table 60: Day seven information activity diary entry for participant 2**

<b>Day 7 – Tuesday (Participant 2) Senior Registrar</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• I was involved in our unit's out-patient clinic today. Opportunity is provided to doctors to directly interact with patients / parents relative with the aim of providing support and treatment for patient's problems. Doctors involved include house officers, registrars, and senior registrars,. Consultants are reached for superior information (if needed)</li> <li>• Sources of information included seminar materials, internet, patient's account of their condition, direct interaction with colleagues (senior colleagues) and textbooks (especially e-books).</li> </ul>
Reason for information activity / consulting the sources	
Was needed information obtained?	
How useful was the information? (to the physician's work role or person where more appropriate)	Information gotten were useful for personal intellectual upliftment, patient's management in terms of counselling, drug treatment and also for the training assessment for doctors.
Any challenges / barriers encountered	No particular significant challenge was encountered today

and how it was resolved	
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**Table 61: Day seven information activity entry for participant 6**

<b>Day 7 – Sunday (Participant 6) Resident</b>	
<b>Required information in the diary</b>	<b>Exact entries in the diary</b>
Information activity done / sources consulted	<ul style="list-style-type: none"> <li>• Activity: patient care, preparation for an English Language test.</li> <li>• Information Source: Internet Drug Reference, Online English Language Test aids.</li> </ul>
Reason for information activity / consulting the sources	To be at par with contemporaries in the use of English language and to pass the test
Was needed information obtained?	Information sought were obtained.
How useful was the information? (to the physician’s work role or person where more appropriate)	Better equipped for the examination and patient care
Any challenges / barriers encountered and how it was resolved	None

## Appendix 7: Examples of one coded and plain transcript

### 1 Interview 8 (Resident) Male

2 *Interviewer: Within the context of your work as a paediatric doctor, what do you consider*  
3 *as your information needs?*

4 **Participant:** The reason is one, to enhance practice, and two, to update my knowledge,  
5 and three to resolve (incomplete statement) because it's not every case that you see that  
6 you can say at that point for sure, to resolve such knotty issues, you need to source for  
7 information. So basically that's what I need information for.

8 *Interviewer: Thinking back on your medical school days can you describe specific*  
9 *trainings aimed to give you the skills to access and use medical information?*

10 **Participant:** There were quite a few though not very formal. I was in an Association in  
11 school called Medical, Research and Maternal Society where we had lectures and seminars  
12 on information skills. Also in the university we formed discussion groups which gave us  
13 the opportunity of sourcing information. There was nothing really formal. — 2

14 *Interviewer: How do you view information access and use in patient care?*

15 **Participant:** It is actually a prerequisite. Medicine is a rapidly changing field where one  
16 cannot have it all. At every point in time there are new discoveries, so there's a need for  
17 you to constantly seek for information as what you know today might be obsolete  
18 tomorrow. Because of that there is always the need for you to update especially now that  
19 the patients are even becoming wiser too. So for you to be up on your game, you must  
20 constantly source for information and update yourself. — 6

21 *Interviewer: What is your view on access and use of information at the point of care?*

22 **Participant:** Yes I do that a lot, but personally if I am seeing a patient and I think I am not  
23 yet clear, I can call my consultant as my first source of information because of the wealth  
24 of knowledge he or she has acquired, then sometimes I consult with my phones, I can  
25 source information through them, I can browse, because it's better that you get that done  
26 than doing the wrong thing because you just want to act based on your residual knowledge.

27 *Interviewer: Would you think that information contributes to patient care?*

28 **Participant:** Obviously, it does. It does by bettering your practice and making you do the  
29 right and correct things at least to avoid making mistakes and to avoid litigations. It also  
30 contributes by letting you be at par with the profession that you are into.

31 *Interviewer: What do you do to get medical information?*

32 **Participant:** For me, colleagues, journals, both hard copy journals and soft copies like  
33 Medscape and American Academy of Paediatrics journal (which I go online to use) In fact,  
34 it's easier using the online sources. For Nigerian journals; Nigerian Journal of Paediatrics  
35 and other journals I source, but commonly, I use the Nigerian Journal of Paediatrics.

36 Interviewer: Why do you use these sources for your medical information?

37 Participant: For American Academy of Paediatrics, the reason is that most topics are  
38 discussed in details with some clarity. I use the Nigerian Academy of Paediatrics Journal,  
39 because it's tropicalized and contains basically things that concern us here. That covers up  
40 the part where the American Academy of Science wouldn't, then Medscape is for general  
41 knowledge in paediatrics.

42 Interviewer: So how often do you need to access and use medical information for your  
43 patient care?

44 Participant: Very often, especially when it pertains to treating patients, it might not  
45 require reading a whole article, it might just require checking up a particular dose of a drug  
46 or checking up a particular symptom for reference.

47 Interviewer: Think back to a specific case in the recent past that you needed information  
48 in the treatment of a particular patient and tell me what led up to that situation.

49 Participant: On Sunday we had a case in the new born unit where I've been working. A  
50 child that had macroglossia came and had some other features that we couldn't tie up to a  
51 particular diagnosis like jaundice, inequality the body system, so the attending physician  
52 first made a diagnosis of congenital hypothyroid syndrome. When I came I reviewed the  
53 case and felt that it could be possible, but that the whole symptoms did not tie up with that.  
54 I looked at the folder which other people had seen and queried Becket Weidman Syndrome  
55 which also had some features in the child. So I had to go and read up those two particular  
56 conditions to see whether we could reach a more definitive conclusion as to what it is and  
57 how to go about it.

58 Interviewer: What specific things did you do in your information search on this case?

59 Participant: Basically first of all I went back to our standard textbooks and read on those  
60 two conditions, then I now started sourcing other differentials of the features the child had  
61 to see whether there was a particular thing that can tie up the features that the child had.

62 Interviewer: How did the information help in handling that patient's case?

63 Participant: It helped in the sense that even if it was a particular case, I discovered it will  
64 be a variant of either of the two. I discussed this with my colleagues as I was handing over.  
65 I discussed my findings and the possible investigation we might do to help us understand  
66 the case more.

67 Interviewer: So, were there any challenges that you faced in the process?

68 Participant: There was nothing because I happen to have a browser that browses very  
69 well. Initially that had been a problem when internet service was still very poor around  
70 here. Another thing that would have been is libraries but most of us have our textbooks  
71 even in soft copy. So nobody depends on the institutional library for information because

72 at best they'll have just a copy of each book and if you are ten wanting to use it, then there  
73 will be a queue and waste of time.

74 *Interviewer: What do you do to keep up to date with your profession?*

75 **Participant:** First are my own study and reading up what other people have done in their  
76 researches. I engage in research also because that's a way of being part of the profession.

77 *Interviewer: Can you think of the things that either help or hinder your effort in keeping up  
78 to date?*

79 **Participant:** Well in the aspect of research, it's a little bit difficult. Research requires  
80 some abstract thinking but there's so much pressure down here; pressure from the family  
81 and relations, financial pressure and so on. So most times the environment for that abstract  
82 thinking is not there. Number two is funding. If you do not have enough funds you cannot  
83 do a reasonable research. The bottleneck of ethical committee is also there. I have a friend  
84 that applied to the ethics committee for clearance and for about four or five months they  
85 hadn't considered her request and it was a time-bound study. So these are some of the  
86 issues. Another one is the reluctance of people in participating in the study. When it has to  
87 do with a study involving the collection of body samples, people are very reluctant to  
88 participate.

89 *Interviewer: How does keeping up to date impact your practice as a paediatrician?*

90 **Participant:** It does affect in the sense that in recent times they've been having studies on  
91 tropical diseases. You see that most of the things you work with in terms of studies being  
92 done are based on studies done in the west. For example if they say that a drug has been  
93 working or a drug has been used, most of the studies on that drug and the clinical trials  
94 were done in the west not considering that there could be differences in terms of the  
95 genetic components the people to make the drug work. Companies do it there because it's  
96 easier and ship it here believing that all the findings would translate here directly, but  
97 sometimes, it doesn't translate and this is another core challenge.

98 *Interviewer: How do your paediatrician colleagues in this hospital keep themselves up to  
99 date?*

100 **Participant:** You just have to continue being informed. For example, in my department  
101 we have various programmes. On Mondays we have our bedside presentation, which is our  
102 morning review, Tuesdays we have our postgraduate seminar, Wednesdays we have our  
103 clinical meeting, Thursdays we have clinical reasoning and Fridays we review the  
104 mortalities and the possible causes of death and what we could have done that we didn't do  
105 or in case we see such cases again what we should do best. So these are avenues that help  
106 us all keep up to date.



107 *Interviewer: Are there any support provided to help people keep up to date?*

108 **Participant:** It's just an individual based thing. Well recently, the department got a  
109 modem that at least five or six people could log on to access the internet for information.  
110 Apart from that, there's been nothing. Most of the things we do for information access are  
111 individualised.

112 *Interviewer: What about the hospital library?*

113 **Participant:** The hospital has a library and also an internet facility. Initially the reception  
114 of the internet service was functional and permitted general use, but I wouldn't know why  
115 they limited it now. It is not everybody that can access it. In fact I don't know the code for  
116 accessing it. Currently it's just the library with hard copy books that we have.

117 *Interviewer: How relevant is the hospital library and librarians in supporting your  
118 information needs?*

119 **Participant:** Well I've never really had any encounter with them because if you go to the  
120 library the books are basically arranged by departments. More often than not, when I need  
121 any book, I just go to the shelf and check-up whatever I want.

122 *Interviewer: If I asked you to reflect on your colleagues' ability to access and use  
123 information, do people differ?*

124 **Participant:** Yes the capacities differ. Some people are computer savvy and at a click  
125 they've got through to the information they need on the Net. These people have some  
126 advanced way of sourcing things from the Net. Last year someone taught me how to use  
127 google scholar. Before then, I did my search only on google search and it was not very  
128 helpful. Since I learnt about google scholar, it's been wonderful for me. So the capacity  
129 differs obviously.

130 *Interviewer: Would you think that this impacts people's practice?*

131 **Participant:** Yes it does. If you are more informed, you are more likely to act better also.  
132 A doctor who has a more update information on what is currently working in terms of  
133 treating patients is likely to obtain a better outcome than those who are less informed.

134 *Interviewer: What do you think you are particularly good at when it comes down to  
135 accessing and using medical information?*

136 **Participant:** I am not shy of asking my colleagues for information. If I meet a case I am  
137 not clear about, I am not shy at asking for my colleague's opinion. Also to an extent I am  
138 good at using my computers to get the information I need.

139 *Interviewer: Which aspects do you think need improvement?*

140 **Participant:** Recently I just got to learn about HINARI and other databases. This is an  
141 area I am trying to improve on, sources where you could actually get specific information

142 in your field. That area is where I have a problem because I am someone that is interested  
143 in research. I want to improve on my ability to get specific information in my field and  
144 also how to get funding for researches which I am very much interested in. (2)

145 Interviewer: Does that imply you would appreciate trainings that could afford these skills?

146 Participant: That would be wonderful if I could get that.

147 Interviewer: What do you think are the things that promote or inhibit your capacity and  
148 that of your colleagues to access and use medical information?

149 Participant: The greatest inhibitor is the fact of, you know as residents your primary goal  
150 is to pass your exams and go to the next level because it's time-bound, so people see  
151 researching for information as the business of the consultants. They want to secure their  
152 positions first, because that's what gives them their meal tickets. Apart from that, the other  
153 issue is that of funding most of your information-search expenses out-of-pocket. In other  
154 places where the hospital library has fast internet access for everyone, it removes that cost  
155 on you. So these are other inhibitors because you have competing demands for the little  
156 resources you have. (11)

157 Interviewer: What do you think are the things that could be done to solve the problems?

158 Participant: We are already working on solving the problems. Individually most of us  
159 have modems that we browse with. We have our different ways of seeking for information  
160 and also we use our consultants who have a wealth of experience too in sourcing for  
161 information. The various departments have their various days of academic activities, and  
162 these are ways of keeping ourselves up to date and better informed. Now about two or  
163 three years ago, the Medical and Dental Council of Nigeria raised the issue of CMEs, that  
164 is, continuing medical education. The hospital is involved in organising some of these  
165 CMEs in the recent past. These are some of the things that are on ground already. (5,7)

- 166
- 167 1. Benefits & perceived implications of information use for patient care (3, 12)
  - 168 2. Information capacity building needs
  - 169 3. Methods used for information capacity & knowledge building
  - 170 4. Necessity for information resources availability for patient care
  5. Physicians' information seeking behaviour
  6. Information needs
  7. Sources used for medical information
  8. forms of information accessed by the physicians
  9. Points of information access
  10. Facilitators of individual information experience
  11. Factors affecting physicians' information experience
  12. Hospital's support for physicians information experiences
  13. Application of information to Patient Care.

1

1 **Interview 15 (Consultant) Female**

2 *Interviewer: Within the context of your work as a paediatrician what would you consider as*  
3 *your information needs?*

4 **Participant:** You know that we are in a world of evidence-based medicine, so most of the  
5 things we do now has to be evidence-based and you need a lot of information which is the  
6 evidence that such a thing has worked somewhere before you can bring it into your own  
7 practice. So if you don't have that information maybe because of lack of sources of  
8 information, or your sensibility to such information or even ignorance that such information  
9 exists, it's going to really put you back because every day new things keep coming. There are  
10 changes both in causes of disease and the interventions. What you may be practicing maybe  
11 like last year by this year another thing has come up and if you are not current with such  
12 information, you find out that you may not be able to keep pace with your colleagues. When  
13 they are talking about something new you'll be lost because you don't have the information,  
14 so information is very needful in our practice as paediatricians.

15 *Interviewer: If I asked you to think back on your medical school days, can you remember any*  
16 *specific training aimed at giving you capacity to access and use medical information?*

17 **Participant:** Apart from the library I cannot remember any course that was organized. The  
18 library was made available and maybe out of interest you go in ask the librarian for what you  
19 need and they put you through on how to search for the information you need. Apart from that,  
20 there was nothing like an organised course or anything like that.

21 *Interviewer: What is your view on information access and use in managing patients?*

22 **Participant:** It's very important and needful. Information should be made available; we  
23 should have sources of information. So there should be things like training to give us ability  
24 to source information, because honestly some of us don't really know how to source  
25 information. I remember the last conference I attended in January 2015 one of the slots was  
26 about how to search for information. They took us through Google scholar and other different  
27 databases that you need to source your information. Many of us were impressed because that  
28 information was new to them particularly how to narrow down your search in order to get the  
29 specific information you were targeting. I need to bend down and keep practicing what they  
30 taught us because I am not yet fully conversant with them and I think it's the same for  
31 everybody. If we don't practice those search strategies often, we may forget them.

32 *Interviewer: How do you view access and use of medical information at the point of care?*

33 **Participant:** We do that even though we do it at a very limited rate because honestly that's  
34 why the advanced countries are better than us. Most times we task our brain to remember  
35 what we read several years back, but I know that in the advanced countries as they are doing  
36 ward round they have information tools to help them key in and know what to do for the  
37 patient at that particular point. The only way we do this in our own setting is just some of the

38 things we carry about maybe the drug formulary, but they are so limited and you cannot rely  
39 on them. We are now grateful that we have the smart phones which enable us to do some  
40 browsing though sometimes they may be very slow and you cannot access what you need.  
41 Accessing information at the point of care is actually very needful whether during  
42 consultation or you are doing the ward round.

43 *Interviewer: How does information contribute to patient care?*

44 **Participant:** It makes diagnosis easier, at least you know the investigations you have to do to  
45 narrow your diagnosis, it also helps you to be specific and reduce the time the patient spends  
46 in the hospital. Sometimes it takes you about three to four days to arrive at a diagnosis in  
47 complicated cases, but that reduces substantially when there is information meaning that it  
48 cuts short prolonged hospital stay for those on admission. Information also helps you to know  
49 the current mode of treatment for particular diseases. In general, information enhances  
50 diagnosis, treatment and follow-up of patients and it also reduces the waiting time even for  
51 outpatients who want to be seen by a doctor.

52 *Interviewer: What are the things you do when you need medical information?*

53 **Participant:** I refer to my sources; I can refer to my textbook, I can refer to my handset and  
54 Google it at that point in time. This is different from if I am in the library or if I am in my  
55 office, that is, if it is at the point I am seeing a patient, but apart from that, I use the library  
56 and I use the internet and browse to find out the information that I need.

57 *Interviewer: Reflect on a specific case in the recent past that you needed information in the  
58 treatment of a particular patient and tell me what led up to that situation.*

59 **Participant:** We had a patient and I was at a loss on what could be the likely diagnosis in this  
60 child. We had the features there but did not know exactly what to do. I went back; researched  
61 and read around the topic and I decided on the most likely diagnosis of what I thought this  
62 child had. I managed the child along the line of what I discovered and the information helped.  
63 There was also a recent one I handled; I am into paediatric nephrology so I had one that  
64 presented with kidney failure and I wondered why so sudden; what could be responsible? I  
65 had to go back and opened up the internet; I looked at the features the patient presented Vis a  
66 Vis the information I got, and that helped me make up my mind on the diagnosis for that  
67 patient.

68 *Interviewer: Were there things that helped or hindered the process?*

69 **Participant:** What helped me was that I had my laptop and I had my internet access in the  
70 laptop. So my laptop and internet access helped me to access the information that I needed.  
71 But you know at that point in time I could not do that and I had to go home to be able to do  
72 that and come the next day to use the information I got. I provided access for myself and I  
73 couldn't do it in the hospital. I needed to go home and do it.

74 **Interviewer:** *Apart from the sources of information you've mentioned are there others that*  
75 *you use as well?*

76 **Participant:** When we attend conferences and workshops we get a lot of information,  
77 especially conferences that are tailored towards sub-specialties, you get information about  
78 your own sub-specialty.

79 **Interviewer:** *Why do you use the sources you mentioned?*

80 **Participant:** Because I believe that the information I have there came out of evidence and  
81 researches that have been done. Like the textbooks that we use, there are a lot of researches; it  
82 is a conglomeration of researches, journals etc. that they bring together to write the text. I  
83 believe that the information in these sources is correct that's why I access the information. I  
84 also believe that at conferences, people present the information from researches they have  
85 done and they are correct information, that's why I use the information.

86 **Interviewer:** *Does it matter that the information you get is based on evidence?*

87 **Participant:** Yes. In evidence-based practice you are removing trial and error. In the past  
88 some of us did a lot of things without evidence. You know chloroquine was once used in the  
89 treatment of malaria and some people are still practicing that even though it is no longer used.  
90 Even with the whole resistance they are still giving chloroquine; sometimes it will work and  
91 sometimes it will not work. The reasons given for why it is not working are based on  
92 researches that have been conducted. It is evidence-based that chloroquine is no longer  
93 working for the treatment of malaria and therefore the right thing to do is to move off  
94 chloroquine to another drug that works. So I so much believe in evidence-based medicine  
95 because it removes a lot of assumptions. You don't have to think that because one patient  
96 presented with this so it must be that. It's possible that the pathogenesis would have changed  
97 and a lot more things would have changed, so you need to research and come up with  
98 information which is your evidence and based your decisions on that.

99 **Interviewer:** *How do you generally keep up to date with your profession?*

100 **Participant:** I will continue to attend conferences; I will continue to do research. That's  
101 essentially what I do.

102 **Interviewer:** *Does keeping up to date impact on your practice?*

103 **Participant:** It impacts so much on my practice. If you are doing your researches, your  
104 conferences, it helps you to keep up with what is happening. It impacts positively on your  
105 patient care because you treat your patients better and your outcomes are better and you are  
106 happy as a clinician that your patients are getting the best and they are happy that they relied  
107 on you. It also helps the institution to improve. At least they know that they have someone  
108 who is a specialist in the area who is current with the practice and it will attract a lot of things  
109 even to the hospital.

110 **Interviewer:** *How generally do your colleagues in this hospital keep up to date?*

111 **Participant:** I think it's almost the same thing because I know they all have their personal  
112 computers, they have internet access; they are always searching the internet for information.  
113 Some also attend conferences to beef up their knowledge and they use the library.

114 **Interviewer:** *Do they get help or support in keeping up to date?*

115 **Participant:** I don't think so apart from that the library is made available and we have  
116 internet access in our library we the department pays for and the doctors use it free. The  
117 hospital library is also free and open to all staff; the textbooks are there and current journals  
118 are there as well.

119 **Interviewer:** *Do you use the hospital library?*

120 **Participant:** Very occasionally. Reason is that I just think that whatever is there I will be able  
121 to afford. I have not seen an added advantage going there to access information that I cannot  
122 easily access in my house, in my office, in my own departmental library. We have more  
123 recent books in our own departmental library, so that's why I occasionally use it.

124 **Interviewer:** *If I asked you to reflect on your colleagues' ability to access and use information,*  
125 *do people differ?*

126 **Participant:** Of course they do.

127 **Interviewer:** *Does that difference impact on peoples practice?*

128 **Participant:** Why not. I know that there are some who are not current; they are not at home  
129 with the current information. When we even come for conferences like we are about to meet  
130 now, when some people make their contribution, you know that they are still lagging behind  
131 and that they don't know the current things that are happening. I think it has to do with  
132 personal effort because the system doesn't give you room. Whether you like it or not, you  
133 must improve because you must cope with the current trends in the field and the practices of  
134 our colleagues elsewhere in the country. There are some of our colleagues that I know that  
135 they differ from others; they are always current with information because they are always  
136 online, while some others are nowhere being current. It all boils down to levels of personal  
137 interest to improve. Nowadays you must have a handheld device that is internet ready or you  
138 will be left out of the information flow. I have bodies I belong to that send me updates on new  
139 researches and other information that I receive on my smart phone and then check on them  
140 more thoroughly when I get home. So doctors differ.

141 **Interviewer:** *What do you think you are particularly good at when it comes down to accessing*  
142 *and using medical information?*

143 **Participant:** Internet. When I say internet, I mean accessing good journals, current journals  
144 on the Net.

145 **Interviewer:** *Is there an area that might need improvement?*

146 **Participant:** I wish the internet will be made available in the ward, in the clinic, wherever  
147 you are, so you can always key in and find out information. So we need availability of  
148 information at all points of services, like in the clinic there's a computer system to use and in  
149 the wards, as you are doing ward rounds, you have systems where you can get information.

150 **Interviewer:** *So beyond making these facilities available you are comfortable with your own*  
151 *capacity to access and use information?*

152 **Participant:** No I am not very comfortable. Even the internet I am using I am not so much  
153 versed in using it. There is some information I would need the help of my colleagues to access  
154 based on how they accessed it themselves. I have not learnt quite properly how to narrow  
155 down my search; I am still developing myself on that.

156 **Interviewer:** *Would you appreciate a capacity building training towards improving on that?*

157 **Participant:** Yes quite frankly.

158 **Interviewer:** *What do you think are the things that promote or inhibit your capacity and that*  
159 *of your colleagues to access and use medical information?*

160 **Participant:** Accessing information depends on its availability. Sometimes it may not be  
161 available for you to use. I don't use the hospital library very often, but I can't say whether the  
162 internet is always on. If the internet is not always on, it will be an inhibiting factor. Then if the  
163 hospital can organise a training to build capacity for some of us, it will also help us in getting  
164 information. At the departmental level we need to have some workshops on the importance of  
165 medical information and how you can access it; how it can improve your patient care and  
166 management. That will also be very important

Appendix 8: The categories (sub-themes) from the interview data coding

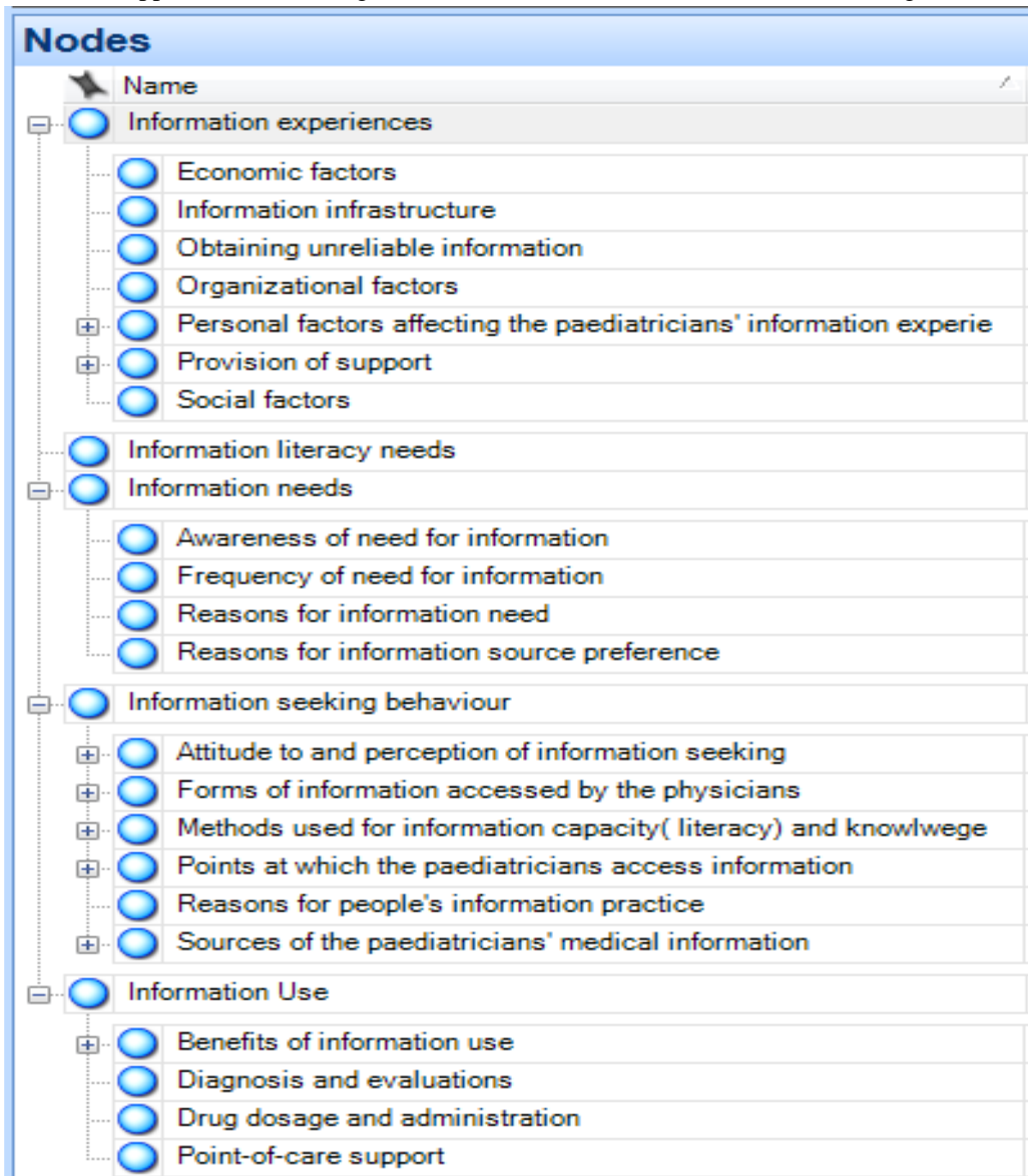


Figure 50: The sub-themes from the interview data coding



Nodes					
Name	Sources	References	Created On	Created By	
Information experiences	1	1	13/05/2015 17:08	S	
Economic factors	9	13	13/05/2015 17:21	S	
Information infrastructure	17	33	25/05/2015 18:21	SKI	
Obtaining unreliable information	3	3	27/05/2015 14:05	SKI	
Organizational factors	8	13	13/05/2015 17:22	S	
Personal factors affecting the paediatricians' information experie	11	18	13/05/2015 17:21	S	
Disposition to information seeking	11	20	15/05/2015 17:48	SKI	
Information capability	5	6	15/05/2015 15:26	SKI	
Lack of time	8	8	15/05/2015 15:25	SKI	
Provision of support	19	45	20/02/2016 12:08	SKI	
Information literacy training	15	21	20/02/2016 12:15	SKI	
Information resources	8	10	20/02/2016 12:14	SKI	
Social factors	7	9	13/05/2015 17:21	S	

Figure 51: Sub-themes and categories under the theme: information experiences

Information needs	4	9	13/05/2015 17:05	
Awareness of need for information	13	24	14/05/2015 12:03	
Frequency of need for information	12	14	14/05/2015 12:31	
Reasons for information need	20	90	14/05/2015 12:04	
Reasons for information source preference	11	20	14/05/2015 12:53	

Figure 52: Sub-themes under the theme: information needs

Information seeking behaviour	16	50	26/05/2015 17:10	SKI
Attitude to and perception of information seeking	2	3	30/06/2015 11:29	SKI
Negative attitudes	11	12	30/06/2015 11:29	SKI
Positive attitudes	9	24	30/06/2015 11:29	SKI
Forms of information accessed by the physicians	2	2	20/02/2016 11:22	SKI
Documentary information	0	0	20/02/2016 11:22	SKI
Information from books	10	18	20/02/2016 11:22	SKI
Information from internet and e-sources	14	23	20/02/2016 11:22	SKI
Information from journals	1	1	20/02/2016 11:22	SKI
Information from laboratory results	4	5	20/02/2016 11:22	SKI
Information from patient records	2	2	20/02/2016 11:22	SKI
Oral information	2	4	20/02/2016 11:22	SKI
Information from colleagues	10	23	20/02/2016 11:22	SKI
Information from patients	3	9	20/02/2016 11:22	SKI
Information from the community	1	1	20/02/2016 11:22	SKI
Information from the Electronic Media	3	3	20/02/2016 11:22	SKI
Methods used for information capacity( literacy) and knowlweg	2	4	20/02/2016 11:25	SKI
Collaborative learning and continued professional develop	10	17	20/02/2016 11:25	SKI
Attending trainings and update programes	9	15	20/02/2016 11:25	SKI
Making presentations at clinical seminars	7	8	20/02/2016 11:25	SKI
Independent learning	1	2	20/02/2016 11:25	SKI
Conducting research	9	12	20/02/2016 11:25	SKI
Engaging with the community	1	3	20/02/2016 11:25	SKI
Engaging with patients	4	5	20/02/2016 11:25	SKI
Personal Reading	14	43	20/02/2016 11:25	SKI
Using hospital library resources	12	21	20/02/2016 11:25	SKI
Learning in the process of practice	12	20	20/02/2016 11:25	SKI
Shared knowledge among colleagues	16	53	20/02/2016 11:25	SKI
Taught programmes and courses	17	28	20/02/2016 11:25	SKI
Use of documentary sources	14	27	20/02/2016 11:25	SKI
Points at which the paediatricians access information	0	0	20/02/2016 11:19	SKI

Figure 53: Sub-themes and categories under the theme: information seeking behaviour

Points at which the paediatricians access information	0	0	20/02/2016 11:19	SKI
Information access at home	3	5	20/02/2016 11:19	SKI
Information access at work	1	1	20/02/2016 11:19	SKI
Access during clinical meetings	2	2	20/02/2016 11:19	SKI
Access during patient consultation and treatment	6	7	20/02/2016 11:19	SKI
Access during ward round	5	6	20/02/2016 11:19	SKI
Access in the doctors' call room	3	3	20/02/2016 11:19	SKI
Information access from other locations	10	20	20/02/2016 11:19	SKI
Reasons for people's information practice	12	36	28/05/2015 17:27	SKI
Sources of the paediatricians' medical information	9	19	20/02/2016 11:16	SKI
Electronic sources	19	59	20/02/2016 11:16	SKI
People	13	44	20/02/2016 11:16	SKI
Pharmaceutical companies	2	3	20/02/2016 11:16	SKI
Print sources (Books and Journals)	19	57	20/02/2016 11:16	SKI

Figure 54: Sub-themes and categories under the theme: information seeking behaviour (continued)

Information Use	2	2	13/05/2015 17:12	S
Benefits of information use	18	35	28/02/2016 10:09	SKI
Answering patient queries	4	4	28/02/2016 10:09	SKI
Avoidance of mistakes	9	19	28/02/2016 10:09	SKI
Being up to date	10	15	28/02/2016 10:09	SKI
Coping with changes in practice	7	7	28/02/2016 10:09	SKI
Correction of mistakes	2	2	28/02/2016 10:09	SKI
Decision-making and resolution of uncertainties	13	23	28/02/2016 10:09	SKI
Helps to broaden investigations	3	5	28/02/2016 10:09	SKI
Increase in personal knowledge	9	16	28/02/2016 10:09	SKI
Making new discoveries from challenging cases	6	12	28/02/2016 10:09	SKI
Provide the best possible health care	12	18	28/02/2016 10:09	SKI
Reduces delay in patient management	3	4	28/02/2016 10:09	SKI
Sensitising and counselling patients	2	5	28/02/2016 10:09	SKI
Diagnosis and evaluations	10	19	13/05/2015 17:12	S
Drug dosage and administration	9	15	28/05/2015 17:39	SKI
Point-of-care support	8	10	14/05/2015 12:11	S

Figure 55: Sub-themes and categories under the theme: information use

# Paediatric physicians' information literacy (IL) experiences and practices in a Nigerian hospital

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## Keywords

information literacy, information skills, Nigeria, paediatric physicians, patient care

## 1. Introduction

The use of correct medical information is seen as crucial in patient care. There is at present, a glut in the amount of constantly-produced significant medical information [1]. Physicians therefore require the ability to effectively access, evaluate and apply new knowledge to facilitate the delivery of best possible healthcare [2-3]. This capability is reflected in the information literacy practices of physicians and also highlights specific information capabilities that support decision-making during patient care. Previous research has suggested that inadequacies in the information skills and information practices of physicians' can lead to incorrect decision-making, with potential negative treatment outcomes for patients [4]. In the African context the extent that this may be the case is likely to be higher due to the struggle for information and knowledge [5]. This study explored: the physicians' awareness, perception and experience of information literacy in patient care; and, the potential impact of physician's information literacy on patient care.

## 2. Methods

The study was conducted with paediatric physicians at a Nigerian tertiary hospital, with a population of thirty-three paediatricians. Data was collected from participants through twenty face to face interviews and one focus group discussion. In addition, observation of paediatricians took place in the workplace while they administered care.

## 3. Results

The physicians' IL was developed through social interaction with their colleagues, clinical review meetings, seminars and self-sponsored computer training. A lack of formal training, in medical school, relating to their information literacy appears to have limited the physicians' knowledge of different medical information sources and also their use of information sources.

However, the study discovered that the new i-media, such as, mobile phones and iPads, were becoming increasingly significant for physicians' enabling access to information relevant to patient care. The majority of participants stated that they used such devices at the point-of-care to cross-check diagnoses, consult colleagues and access electronic medical information sources. This indicates an awareness of the significance of accessing medical information and how this can help patient care, despite the absence of taught IL programmes. The reason given for using i-media was the ability for it to enable access to real-time information while physicians are undertaking patient care. In general, factors that influenced the physicians' personal choices of information sources were ease of use, availability and affordability.

Factors that inhibited use were the cost, slow Internet connectivity and a lack of time due to work load. The physicians considered access to information resources and information literacy as a necessity for patient care. The ability to access and use correct medical information was perceived, by the

physicians, as contributing to the quality of each physician's decisions and possible treatment outcomes. Differences, however, existed in each physician's proficiency and rate of use implying that to ensure uniformity of good practice information capabilities would need to be developed systematically.

#### 4. Conclusions

In this Nigerian tertiary hospital it was found that the IL of physicians varied and where there was a lack of IL this could have a negative impact on patient care. This echoes the findings of other researchers in different contexts [6-7]. It was also found that new information media was now being used by physicians to access information, however, the ability to use these technologies varied. As a consequence, training that was embedded in the workplace, where physicians could develop their information literacy and their use of evidence, plus the current technologies that enable access, was seen to be a necessity. In addition, an improved information environment, such as better access to medical resources via the internet, is also likely to lead to improved patient-centred IL practices and better quality patient care in general.

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# Paediatric physicians' information literacy (IL) experiences and practices in a Nigerian hospital

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## 1. Purpose

Investigate the paediatric physicians information literacy experiences and their information practices for patient care

## 3. Methods

- Qualitative, exploratory study
- Interpretive phenomenological approach
- One focus group discussion
- Twenty semi-structured interviews
- Observation
- Thematic data analysis

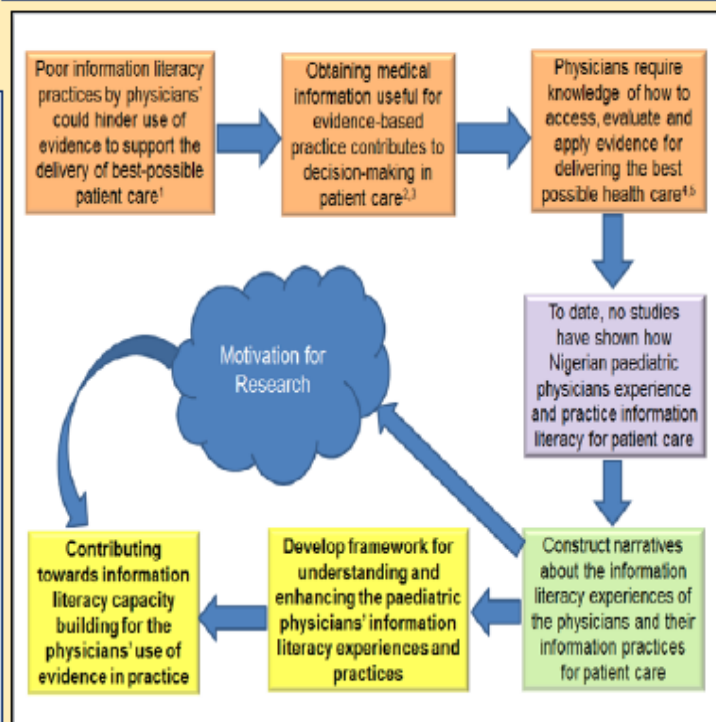
## 4. Preliminary Results

- There was inadequate and varied information literacy training for the physicians.
- Physicians information practices developed through semi-formal, inter-personal information sharing and self-learning.
- New i-media were increasingly utilised at the point-of-care for access to real-time information relevant to patient care.
- Personal choices of information sources were influenced by ease of use, availability and affordability.
- Inadequate and costly internet services and e-resources prohibit access and use of information.
- Physicians perceived that access to, and correct use of information enables the provision of appropriate healthcare

## 2. Objectives

To explore;

- The physicians' awareness, perception and experience of information literacy in patient care;
- The influence of the physicians' information literacy on information practices for patient care;
- Inhibitors to the experience and practice of information literacy for patient care;
- Potential implications of the physicians' information literacy practices for health care provision.



## 5. Conclusions

- Ensuring uniformity of good information practice requires systematic development of the physicians' information capabilities e.g. embedding IL courses in the residency training.
- Conscious workplace knowledge transfer needs support e.g. mentoring where physicians could develop their information capabilities, their use of evidence, and their technical knowledge, enabling access to information.
- Better access to medical resources e.g. availability of e-library at the point of care, is likely to lead to improved information practices and better quality patient care in general.

## 6. What next?

- Second phase of data collection through participant informant diaries.
- Triangulate all data sources.
- Final write-up of narratives.
- Develop framework to guide actions toward the information literacy needs of the paediatric physicians.
- Conclude research.

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