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**COLLEGE OF EDUCATION**

**SCHOOL OF INFORMATION AND COMMUNICATION STUDIES**

# HEALTH INFORMATION SEEKING BEHAVIOUR ON THE INTERNET IN GHANA: A SURVEY OF GRADUATE STUDENTS AT KNUST.

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**(10442553)**

**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL INFORMATION STUDIES DEGREE**

**JULY 2015**

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# DECLARATION

I do hereby declare that this thesis is my own original work and has not been submitted either in whole or in part to any institution for any degree. Where references are made to works of other researchers, due acknowledgements are given.

Finally, I wish to state that, I take full responsibility for all shortcomings, misinterpretations and weaknesses that may be identified in this work.

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# DEDICATION

I dedicate this work to my entire family, especially my wife, Mrs Esther Akos Glago Humphrey-Ackumey and daughter, Mildred Edinam Yawo Humphrey-Ackumey for their love and support.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| CMIS | Comprehensive Model of Information Seeking |
| CARLIGH | Consortium of Academic and Research Libraries in Ghana |
| GRASAG | Graduate Students Association of Ghana |
| HBM | Health Belief Model |
| HI | Health Information |
| HIS | Health Information Seeking |
| HISB- | Health Information Seeking Behaviour |
| HS | Health Seekers |
| KNUST | Kwame Nkrumah University of Science and Technology |
| SPSS | Statistical Package for Social Sciences |
| TECH | Technology |
| TM | Trans Theoretical Model of Behavioural Change |
| U & G | Uses and Gratification |
| UITS | University Information Technology Service |
| USA | United States of America |

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# DEFINITION OF TERMS

**Health Behaviours (HB): A**ny activity undertaken by a person ( e.g. graduate students) for the purpose of preventing or detecting disease or for improving health and wellbeing (Conner, 2002)**.**

**Health Information Seeking (HIS):** "A process of seeking information needed for personal decision-making related to health and medical issues." (Warner & Procaccino, 2004).

**Information Seeking Behaviour (ISB):** The "purposive seeking for information as a consequence of a need to satisfy some goal where the individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as the World Wide Web)." (Wilson, 2000). On the other hand, health information seeking behaviour studies look at illness behaviour more generally and focus in particular on motivating factors of illness perception and health belief.

**Health Seekers (HS):** A term used to describe individuals or group (e.g. graduate students) who use the Internet to search for health information.

**Internet:** Is an extensive carrier of a range of information resources and services, such as the inter-linked hypertext documents and applications of the World Wide Web (WWW),

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the infrastructure to support email, and peer-to-peer networks for file sharing and telephony which people (e.g. graduate students) use to seek health information.

**Behaviour on the Internet:** Observable patterns in the health information seeking activities of respondents including the media and Internet tools and applications they tend to employ.

**Graduate Students:** Students who are pursuing post-first degree programmes in Sociology, Medicine, Pharmacy, Allied Health in Kwame Nkrumah University of Science and Technology.

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# ABSTRACT

The Internet is transforming the way in which consumers seek for health information to approach their health care and needs. The purpose of this study was to investigate health information seeking behaviour on the Internet among graduate students in KNUST. Grounded in the tradition of human health and information seeking literature, the study was underpinned by Johnson's Comprehensive Model of Information Seeking (CMIS) theory.

The study adopted a quantitative method using a cross-sectional survey approach. The study involved a sample of 256 and restricted to graduate students studying courses related to health in the Arts and Social Sciences and Sciences (Sociology, Medicine, Allied Heath and Pharmacy). Data was analysed using SPSS version 17.0 and presented by means of both simple descriptive and inferential statistics with a response rate of 77.3 %. Results showed that most of the respondents used search engines, non-advertising Internet sources, and social media networks to source for health information on the Internet. The respondents preferred the Internet because it was timely, fast and provided information from different sources simultaneously. They also indicated that it provided lots of very useful information on preventive medicine and also ensures the confidentiality and anonymity of health information seekers. The type(s) of health information mostly sought for were general information on healthy lifestyle, specific information about a specific disease or treatment, information on the side effects of medications, information about new development in the medical field among others. Majority (90.9 %) of the respondents trusted the health information on the Internet.

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Surprisingly, majority (56.6 %) did not verify the information obtained online with medical practitioners although they had concerns with online health information. As for the demographic characteristics (gender and age) of the respondents, only age was found to be influenced by (be an antecedent of) ($p$<0.05) the usefulness or utility of all the online channels and resources. The most leading barrier to effective health information seeking on the Internet among health seekers were unstable Internet connectivity and erratic power supply. Following from the findings, the researcher recommended that students' information retrieval training programmes should be enhanced. Authorities in KNUST should adopt alternative power (renewable energy sources) supply and also improve the internet infrastructure.

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# CHAPTER ONE

# INTRODUCTION

## 1.1 Background to the Study

Health Information Seeking Behaviour (HISB) is largely regarded as the means by which individuals acquire information about health (illness, health promotion and risks to health) (Lambert & Loiselle, 2007) from different sources or resources such as print, health specialist, interpersonal, Internet, radio *et cetera* (Gavgani, Qeisari, & Jafarabadi, 2013; Wilson, 2000).

The Internet in particular is a major tool used by all categories of people worldwide for seeking information for both professional and private reasons (Siliquini et al., 2011; Kummervold et al., 2008; Trotter & Morgan, 2008; Renahy, Parizot, & Chauvin, 2007). The Internet usage or penetration worldwide as at 30th June 2014 was 42.3 %, with Africa recording 26.5 %. Ghana which is rapidly developing as an information technology hub in Africa had 20.1%, an increase of about 6% over 2012 statistics (www.internetworldstats.com; Ansah-koi, 2013; Borzekowski, Fobil, & Asante, 2006). According to Horrigan and Rainie (2002), Internet users are more likely than non-users to have high prospects of accessing any available information online.

The Internet has emerged as a new and innovative channel for obtaining health information (Chang & Im, 2014) and is becoming a challenging tool for its use for health purposes (Siliquini et al., 2011). There are thousands of health-related websites, and health topics are claimed to be the sixth largest content area on the Internet (Ayers & Kronenfeld, 2007; Alkhalaf, 2013). The Internet phenomenon has enabled

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many individuals and groups though not everybody to pursue additional sources of health information online for themselves other than consulting the physician (Tu & Hargraves, 2003; Rice, 2006; İnceoğlu, Özçetin, Gökmen Tol, & Alkurt, 2014).

The health information seeking behaviour on the Internet phenomenon has been studied by some scholars among certain groups of Internet users such as patients (e.g., patients with chronic disease), young adults, doctors, nurses, college students among others (Abedi, Ashrafi-Rizi, Zare-Farashbandi, Nouri, & Hassanzadeh, 2014; Filippi et al., 2014; Yoon and Kim, 2014; Alkhalaf, 2013; Oyelami et al., 2013; Jiménez-Pernett, de Labry-Lima, Bermúdez-Tamayo, García-Gutiérrez, & del Carmen Salcedo-Sánchez, 2010). Different groups use the internet to seek for health related information differently (Ansah-koi, 2013). According to the Pew Internet Report (2013), demographic factors (gender, age, education etc.) have an influence on online health seeking behaviour. The report also revealed that females are more likely to figure out a possible diagnosis online than males. Also, younger people and advanced college degree holders are more likely to source health information on the Internet than older and less educated people (Fox & Duggan, 2013). Ansah-koi (2013) for instance found that graduate students in the University of Ghana studying, Sociology, Communication and Medicine sourced for online health information differently in relationship to their course of study.

Health information on the Internet could be particularly beneficial in aiding young adults or students who are major users of the internet in several ways including research (Arthur & Brafi, 2013; Beck et al., 2014) to maintain good physical, psychological, and social well-being (Chang & Im, 2014). The information can

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enhance self-education on issues such as personal care and illness prevention as well as fill information gaps (U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion, 2010). The availability, the anonymity, and the privacy of health web sites present an opportunity for many people who have limited access to community health services (Chang & Im, 2014) to seek a second opinion (Nsuangani & Pérez, 2006).

The possible risk and harm (drug abuse and death) associated with the sourcing for misleading and unreliable health information on the Internet due to lack of regulation (Morahan-Martin, 2004; Sethuram & Weerakkody, 2010; Siliquini et al., 2011) has necessitated this study.

As reported by Ansah-koi (2013), the Internet provides variety of sources that enable people to access health related information. These according to Alkhalaf (2013) could be categorised into three: Internet advertising sources (e.g., drug brand Web sites, Internet ads); Non-advertising Internet sources (e.g., health-related Web sites such as WebMD) and Social media sources (e.g. Facebook, ask.com, blogs, wikis, YouTube).

The 2013 Pew Internet Report revealed that 77 % of health information seekers on the Internet used search engines (Google, Bing or Yahoo) to access the internet. However, 13 % began their search directly from specialised health related websites (WebMD), whiles only 2 % and 1 % of the health information seekers started their search from general websites (Wikipedia) and social network sites (Facebook) respectively (Fox & Duggan, 2013).

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In recent years, health information seeking behaviour (HISB) on the Internet has seen some significant increase worldwide, hence a vital subject for research (Diaz et al., 2002; Norman & Skinner, 2006; Andreassen et al., 2007; Renahy, Parizot, & Chauvin, 2007; Kummervold et al., 2008; Siliquini et al., 2011). Research studies conducted in the United States according to Fox and Duggan (2013) found a rate up to 81 % of Internet health-related information users. Several studies conducted in Europe showed an increase, with Andreassen *et al.* (2007) reporting 71% in 2005 of health information seeking behaviour on the Internet amongst different countries (e.g. Italy, France etc.) (Morahan-Martin, 2004; Bundorf, Wagner, Singer, & Baker, 2006; Andreassen et al., 2007; Siliquini et al., 2011). In Nigeria, 61 % of young educated adults use the Internet for self-care and are aware of the availability of health information on the Internet (Oyelami et al., 2013). Borzekowski, Fobil and Asante (2006) reported that 53 % of both adolescents in and out of school go online for health information in Ghana.

Perusal of literature revealed that most of the studies carried out on health information seeking behaviours on the Internet were conducted mainly in developed countries such as USA, Italy, and France among others. Only a few developing countries such as Nigeria, Ethiopia and Kenya were reported (Fidzani, 1998; Nwezeh, 2008; Gatero, 2010; Kivuti-Bitok, McDonnell, Pokhariyal, & Roundsari, 2012; Andualem, Kebede, & Kumie, 2013; Oyelami et al., 2013; Ogunmodede, Ebijuwa, & Oyetola, 2013; Brinkel, Krämer, Krumkamp, May, & Fobil, 2014). Similarly, relatively few studies have been carried out in Ghana focusing on university graduate students' use of the Internet as a source for health-related information. Graduate students are the future leaders of the Ghanaian society; hence, identifying the health behaviours and concerns

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that influence their lives may result in approaches to health education and prevention that have societal as well as individual effect (Kernan, Bogart, & Wheat, 2011).

To encourage Ghanaian students to make proper use of the abundant health information available on the Internet, the factors associated with health information seeking behaviours on the Internet (HISBI) among this group need to be identified. Possible factors that influence ( predictors of) health information seeking behaviour on the Internet among young adults have already been identified (Chang & Im, 2014). Some of these factors are demographic (e.g. gender and age) characteristics, Internet experience and perceived characteristics of the Internet (Borzekowski, Fobil & Asante, 2006; Ansah-koi, 2013; Alkhalaf, 2013). However, the complex relationships among these factors are not well understood in Ghanaian student population.

To fill this gap, the present study sought to explore the type(s) of health information, sources of health information, and the potential factors (predictors) that influence graduate students' health information seeking behaviour on the Internet. The causal or influential factors (predictors) were selected based on Johnsons' Comprehensive Model of Information Seeking (CMIS) and literature review. A better understanding of these factors could help to identify the health needs of users and finding ways to increase individuals' participation in disease prevention, health education and promotion in Ghana.

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### 1.1.1 Study Setting

The setting for the study was Kwame Nkrumah University of Science and Technology, Kumasi which is one of Ghana's public tertiary institutions. It is the first Science and Technology biased institution established by the state and has undergone a lot of technological changes over the years in a bid to build the human capacity in Ghana. It is also the first public university in the northern sector of Ghana. KNUST offers graduate programmes in the Arts and Sciences. It has a motto that reads *'Nyansapo wosane no badwemma'* which literally translates into English as 'the knot of wisdom can be untied only by the wise'. The University was initially established as the College of Technology, Science and Arts with the passage of the Gold Coast Ordinance (No. 19) on 6th October, 1951. It however, opened officially on 22nd January, 1952 with 200 teacher training students transferred from the Achimota College to form the nucleus of the college. The College admitted its first set of engineering students in 1952 and in the same year students were admitted to the Commerce Department for courses in Accountancy and Secretarial Studies (Pitcher, 1976).

KNUST was restructured into a collegiate system in 2004. Some of the faculty libraries and departmental libraries were amalgamated to form college libraries and together with the main library forms a library system. The library system provides relevant information to the culturally diverse students in both print and electronic format. The KNUST Library System has about 198,150 volumes of e-resources. In addition, the university provides Internet services to the university community

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which is accessible to over 4,587 graduate students through various computer laboratories all over campus (KNUST Library Annual Report, 2014).

The Act establishing the University defines its mandate, which essentially is to provide higher education, undertake research, disseminate knowledge and foster relationships with the outside persons and bodies. The strategic mandate of the University is derived from Science and Technology in its name. The university has a vision to be globally recognised as the Premier Centre of excellence in Africa for teaching in Science and Technology for development; producing high calibre graduates with knowledge and expertise. KNUST also has a mission to provide an environment for teaching, research and entrepreneurship training in Science and Technology for the industrial and socio-economic development of Ghana, Africa and other nations. KNUST also offers service to community, is opened to all the people of Ghana and positioned to attract scholars, industrialists and entrepreneurs from Africa and other international communities. The University also has the following core values: Leadership in Innovation and Technology; Culture of Excellence; Diversity and Equal Opportunity for All; Integrity and Stewardship of Resources.

KNUST treats student health and well-being with outmost priority. The school therefore has two major medical facilities that cater for health related issues. The TECH hospital serves the University and its surrounding communities. It is one of the well-resourced hospitals in the Kumasi Metropolis with experienced medical practitioners in charge. To make health care easily accessible to students, there is a Students clinic which handles' students' issues. Students have the opportunity to visit the clinic on a walk-in basis. To augment the works of the

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hospital and clinic, there is a sports stadium, gymnasium, Olympic size swimming pool and a number of pharmacies spread across campus (KNUST Facts and Figures, 2014).

## 1.2 Statement of the Problem

Young adults in tertiary institutions dominate the online population as they represent the most active Internet users among all age groups in Ghana (Arthur & Brafi, 2013). Seeking for health information from the right sources such as those managed by health professionals on the Internet has great benefits like ease of access, consumer anonymity, speed of access and assurance of everyday (24/7) availability of information to this unique group. Some Ghanaian websites wholly address health associated topics with regard to the general population which is of great benefit to young graduate students.

However, the rapid growth in the number of online information seekers, wide availability of information on the Internet coupled with the pace at which informal websites and blogs are created in Ghana has raised concerns about the quality of health-related information on the Internet and its potential adverse effects (e.g. drug abuse) on health behaviours and outcomes that may occur due to following poor quality, incomplete and misleading health information on the Internet by graduate students (e.g., Alkhalaf, 2013). This is problematic since this age group who are future leaders are being exposed to the risk involved in the potential misleading and low quality health information on the Internet.

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Searching online for health information and use has the potential to positively or negatively affect health behaviour and health outcomes of a significant proportion of the graduate students' population. The negative effects could be very serious when it comes to using unreliable health-related information since there are even suicide methods on the Internet (Cline & Haynes, 2001). Some scholars have attributed negative health effects to following poor quality and misleading medical information online (Alkhalaf, 2013).

Also, factors such as free open source with no supervision, low cost of publication, anonymity of authorship, high speed rate at which information is added and changed, lack of peer review and regulation of the Internet would result in young web users not being able to exclusively use official websites whose content is trustworthy and certified by experts and quality labels (Borzekowski , Fobil & Asante, 2006; Beck et al., 2014).

There is a problem with the proliferation of online pharmacies that advertise, sell and deliver medicines or drugs even without written prescriptions from physicians. Findings suggest that the increase in drug abuse and misuse can be partially attributed to these online pharmacies (Meyers, 2001). Therefore, the urgent need for health and risk prevention education among students in universities.

As a result of the various factors and risks such as access to low quality, incomplete, misleading, unreliable source and inaccurate information posed by the Internet, seeking for health information on the Internet therefore presents certain risks which can cause serious problems to students. Also the unlikeliness of students to verify the

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accuracy, and credibility of information sought for online; refusal /delay in seeking health care from right sources can also lead to misuse and abuse of health information sourced online. This can lead to illness and or premature death or adverse health condition later in life and therefore a major effect on the university community and the nation at large (Borzekowski, Fobil & Asante, 2006).

Although research on health information-seeking behaviour has proliferated in recent years with a lot of models and theories developed, relatively few studies have focused on university students' use of the Internet as a source for health-related information in Ghana. Most of the health information seeking behaviour studies done on graduate students have been in the USA, Europe, Middle East and a few African countries like South Africa, Kenya and Nigeria (Escoffery et al., 2005; Lambert & Loiselle, 2007; Sillence, Briggs, Harris, & Fishwick, 2007; Afolabi, Daropale, Irinoye, & Adegoke, 2013; Bin, Salman, & Ahmed, 2013; Egunjobi & Akerele, 2014).

The study seeks to investigate where and why students access health information on the Internet; the type(s) of health information sought for on the Internet, the barriers that hinder the health information seeking behaviour of graduate students of KNUST on the Internet in Ghana and to make recommendations that might prevent such risks and consequence associated with searching for health-related information on the Internet.

## 1.3 Purpose of the Study

The purpose of the study was to investigate health information seeking behaviour on the Internet among graduate students of KNUST and to make recommendations.

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## 1.4 Research Objectives

The following were the specific objectives of the research:

1. To find out sources graduate students consulted for health information on the Internet
2. To identify the perceived factors that influenced preference for the Internet health information sources.
3. To identify the type(s) of health related information students search for on the Internet
4. To find out whether university students verify the reliability of health related information they find on the Internet.
5. To determine any association between demographic characteristics of graduate students (gender and age) and health information seeking behaviour (usefulness of resources and channels online).
6. To identify the constraints to effective seeking and use of health related information on the Internet.
7. To recommend to stakeholders on how students' health information needs can effectively be satisfied.

## 1.5 Research Questions

The study sought answers to the following research questions:

1. What sources did graduate students search on the Internet for health related information?
2. What perceived factors influenced students' preference for the Internet sources they used?
3. What type(s) of health related information did university students search for

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on the Internet?

4. Did university students verify the reliability of health related information they found on the Internet?
5. What association existed between demographic (gender and age) characteristics of graduate students and their health information seeking behaviour (usefulness of resources and channels)?
6. What were the constraints to effective seeking and use of health information on the Internet?
7. What measures are required to enable stakeholders satisfy students' health information needs?

## 1.6 Theoretical Framework

The Johnson's (1997) Comprehensive Model of Information Seeking (CMIS) was the main theoretical framework for the study.

The CMIS (Figure 1.1) considers both the cognitive and social characteristics of consumers' information seeking behaviour in a complex approach. The cognitive characteristics are represented by demographic and direct experience factors. However, the social aspects are recognised through the information carrier factors as one of the systems of the social surroundings.

According to Rains (2008), the CMIS is the only model among all theories and models of information seeking behaviour that "gives a great deal of consideration to the potential importance of the communication medium". Originally, the CMIS was developed to specifically explain women selection

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and use of a particular communication medium (a magazine) to acquire cancer-related information (Johnson & Meischke, 1993a; Johnson, 1997).

According to Johnson and Meischke (1993a), the CMIS combines different components that have been studied within three health behaviour and media theories. These three theoretical perspective are: the health belief model (Rosenstock, 1974), uses and gratifications theory (Rubin, 1986), and a model of media exposure and appraisal (Johnson, 1983). The CMIS is however grounded in the central premise of uses and gratifications approach (Blumler & Katz, 1974; Rubin, 1986), which asserts that people actively select and use communication media to achieve goals.

The main and obvious advantage of the CMIS over other models of health information seeking is its capability in addressing the causal factors related to information seeking and selection of sources. The model comprises three primary classes of variables: antecedents; information carrier factors; and information seeking actions.

The antecedents variable (first) includes four different types of factors that could predict the perceive utility of a medium by an individual and, in turn, his or her information seeking behaviour. Two of the factors are grouped under the label “background factors” and they relate to demographic and socioeconomic factors and individuals' direct experience with the health topic under investigation. The other two factors are under the label “personal relevance factors” and they relate to salience or personal significance of the

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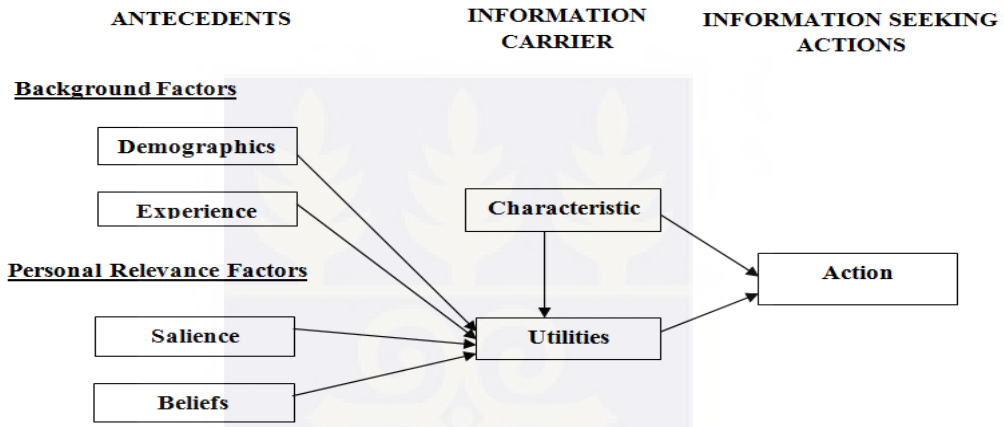
information and beliefs or one's sense of efficacy to manage health topic under investigation.

Johnson (1997) revealed that these antecedents are comprehensively drawn from Rosenstock's (1974) health belief model (HBM) and Prochaska and DiClemente's (1983) Trans theoretical Model of behavioural change (TM).

**Figure 1. 1: The CMIS**




*Source: Johnson, J. D. (1997, p. 3)*

The second primary class of variables (information carrier factors) comprises of two characteristics (perceptions of information carrier characteristics and perceptions of information carrier utility). According to Johnson's (1997) CMIS, the perceptions of the information carrier utility is directly predicted by the perceptions of the information carrier characteristics alongside the antecedents. In turn, information seeking action is determined by the information carrier characteristics and utility. Specifically, individuals with particular background and personal relevance factors, and also have positive perceptions about the characteristics of the information source, perceives the source to have greater utility, which in turn would increase the scope

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and depth of the use of source under investigation. The perception of the utility of a medium or a source is concerned with what individuals relate to sources around them in terms of usefulness. This would subsequently shape their perceptions together with the nature of the specific intentions to seek information from existing sources. Lastly, the third primary class of variables in the CMIS are represented by the actual use of a particular source for information seeking (Alkhalaf, 2013).

The CMIS has been fully or partially tested by some scholars and has produced consistent results that support the capability of the model in explaining information seeking behaviour across diverse contexts (e.g., Johnson & Meischke, 1993a; Johnson, Donohue, Atkin, & Johnson, 1995; Johnson, 1997; Kelly, Andrews, Case, Allard, & Johnson, 2007; Rains, 2008; Holtgräfe & Zentes, 2012). Johnson and Meischke (1993a) for instance conducted a study using the model in an attempt to predict the mammography use and cancer related information seeking using a sample of 366 adult women. According to them, the model resulted in an excellent fit to the data received. However, the results revealed that information carrier factors were more strongly associated with information seeking actions than the health-related antecedents. As the health related antecedents had an extremely low explanation of the perception of the information carrier utility, and eventually, information seeking actions. The reason for their findings was attributed to the antecedents (experience, salience, and beliefs) being purely health-related factors. Johnson and Meischke (1993a) further suggested that models that attempt to examine information seeking from mass media should focus on purely communicative factors rather than health related factors and this is where this study will focus.

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Several researches have been conducted using the CMIS in accordance with Johnson and Meischke's (1993a) suggestion, by paying more attention on communication factors than health related factors. Holtgrafe and Zentes (2012) for instance used the CMIS along with other theoretical approaches to identify and examine factors that influenced the use of the Internet for non-prescription drug information seeking giving much attention to the utility and perceived credibility of the medium. Rains (2007) also examined the relationship between perceptions of traditional information sources and use of the Internet to acquire cancer related health information drawing from uses and gratifications theory and the CMIS.

Johnson's CMIS like several other health information seeking models has been criticized by scholars. One of the major criticisms of the model relates to its linearity. Johnson (1997) acknowledges this limitation by stating that "currently, the CMIS does not specify the nature of feedback loops that might be associated with one particular linear sequence of information seeking". This statement implies that efforts to eliminate this weakness are being undertaken and may see light soon.

In summary, the CMIS postulates that information seeking actions are directly driven by the perceptions of the source characteristics and the source utilities, which are influenced by the person's demographic background (e.g. gender and age), direct experience with the health related problem/disease, his or her beliefs, and the salience or importance of the information about the disease to that person. Drawing from the CMIS and related literature, this study examined the influence of a number of variables on the perceptions and actual use of a number of online sources to seek Health information among university graduate students.

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## 1.7 Significance of the Study

The study is significant in many ways; it is the first of its kind to be undertaken at the Kwame Nkrumah University of Science and Technology. In the academia, the study adds to the already existing knowledge in the area of study and fills a gap in research in health education literature in Ghana. This is because most of the researches done on health information seeking behaviour on the Internet among graduate students are in developed countries where the Internet penetrations are high. The research serves as foundation for further research into health information seeking behaviour phenomenon in Ghana. It also contributes to the theory that was used to investigate health information seeking behaviour on the Internet.

For the Government, the study assists policy makers and stakeholders to understand the health information needs of this important group of students and come up with appropriate health policies to address their needs by ensuring better access to health and also the quality of healthcare. Also health information is a critical element of a community system and extremely important for generating data which in the long run helps in dealing with health related issues nationally therefore enhancing development in the long run.

For the Library and Information profession, this research study serves as a guide as to how future online health information would be shaped. This study contributes to make academic librarians and Internet information providers more aware of the needs of diverse students and give service guidelines to librarians and content managers. The research also gives insights to web developers on how to structure health information on the Internet to suit the multicultural consumers of such information.

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The study also provides general knowledge on the significance and disadvantages of using the Internet for health information by different user groups.

Conclusions drawn from the survey offer health practitioners some idea about university students' health information seeking behaviour on the Internet in relation to other sources of health information. By looking at this user group, the study leads to a better understanding of the patterns of Internet use for seeking health information among a specific group of students in Ghana and help medical professionals or health centres to be able to provide effective information support to university students.

Considering the fact that health information is one of the most searched and accessed information online (Fox, 2011; Alkhalaf, 2013), any research with health information as its focus is very significant. Particularly, the use of the Internet for health information by graduate students is relevant because the Internet is changing the manner people access, share and communicates information on any relevant topic irrespective of their sociocultural and demographic background.

The study contributes to the enhancement of knowledge related to a unique segment of the Ghanaian population that extensively uses the Internet. Students in the university are a unique and interesting group to study. They differ among other students because they are now between childhood and adulthood, between work and leisure (Jones & Madden, 2002), and probably close to establishing their own families if they haven't already. They are the parents of the near future, who happen to be more embedded in technologies and the Internet in particular as they were among the first

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in Ghana to use the Internet for communication (Arthur & Brafi, 2013). Several research reports indicate that university students have made the web one of their first resources for obtaining answers to all questions, including those related to health topics (Percheski & Hargittai, 2011). They are the population from whom the younger generation may learn, imitate, and inherit habits. Exploring online information seeking of such a group could provide us with insights on how future online trends may be shaped.

Lastly, given all the aforementioned issues that are increasingly becoming public health concerns (e.g. low quality of health-related online information, weak tendency to verify accuracy of online health information, and misuse of drugs), university students are a common denominator. One cannot pass on statistics that show the steady growth in the number of students seeking online for health related information without pausing to explore this phenomenon. With these increasing concerns, exploring university students' online information seeking about health becomes even more pressing.

## 1.8 Scope and Limitation of the Study

The study focused on graduate students taking selected courses in four disciplines (Sociology, Medicine, Allied health and Pharmacy) in KNUST. This was because those selected disciplines had to do with health behaviour and health related studies or education. This was to ensure that respondents were in a position to express their candid opinions on Internet health information sources that they are familiar with.

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Ideally, it would have been appropriate to include other students. However, the sample size would have been too large for the period of the research and would not make the study feasible.

The sample used may not give a true representation of the population since the sample was picked among students offering selected courses in the Arts and Science disciplines whose courses are related to social behaviour and health studies. Therefore, the consequence of bias introduced into selection.

## 1.9 Organisation of the Study

The study was organised into six chapters as follows: Chapter One serves as the introduction to the work and put the work in perspective. It provides the background to the study, problem statement, the purpose, objectives as well as the significance of the study. The theoretical framework that guided the study is also discussed in this chapter. The scope and limitations as well as the organisation of the various chapters were spelt out in this same chapter.

Chapter Two focused on the literature review. Relevant and pertinent literature relating to the central problem of the study was reviewed and presented in this chapter. Literature was reviewed on the following themes: Concepts of health information seeking behaviour; Factors that influence health information seeking behaviour on the Internet; Information seeking and the Internet as source of health information; Concerns and trust of online health information; Health seekers and self-diagnosis; Impact of Internet health information; Constraints or barriers to health information seeking on the Internet.

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Chapter Three presents the research methodology. It discusses the research design, population/sample size, research instrumentation (questionnaire), method of data collection (response rate), ethical considerations, and method of analysis and presentation of results.

Chapter Four looked at data analysis and findings.

Chapter Five looked at the discussions of the findings.

Chapter Six also provided the summary of findings, conclusions and various recommendations from the findings of the study for consideration by the stakeholders and policy makers.

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# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

A literature review is a carefully crafted summary of recent studies conducted on a topic that include the key findings and methods researchers used while making sure to document the sources. It is based on the assumption that knowledge accumulates and that people learn to build on what others have done. It is, however, not a chronological list of all the sources, but an evaluation, blending the previous research together, and also explaining how it blends or integrates into the proposed research. All sides of an argument must be clearly explained, to avoid bias, and areas of agreement and disagreement should be highlighted (Kreuger & Neuman, 2006). The study implemented the integrative form of literature review where reviews are basically summaries of past research (Creswell, 2003).

This section reviewed literature on related works on the topic understudy in view of the World, Africa and Ghana under the following themes:

- Concepts of Health Information Seeking Behaviour
- Factors that Influences Health Information Seeking Behaviour on the Internet
- Information Seeking and the Internet as a Source
- Consumers Health Care Services in Ghana
- Health Seekers and Self Diagnosis

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- The Impact of Internet Health Information
- Barriers/constraints to Effective use and Health Information Seeking on the Internet

## 2.2 Concepts of Health Information Seeking Behaviour (HISB)

The first phase in a scientific research process according to Frey, Botan, and Kreps (2000) is the formation of an idea with regards to what is going to be studied and making provision for conceptual definition concerning the variables that will be included in that study. Frey, Botan, and Kreps (2000) further reported that terms are usually defined by researchers by their conceptual meaning, which is an indication that a conceptual definition is a supposed description regarding the meaning of a term in relation to other abstract concepts within a specific context.

Some concepts like gender and age are unambiguous and no or little confusion may occur with regard to their meaning**.** However, the definition of a lot of other concepts like self-efficacy, perceived risk, and usefulness of sources are not done in the same manner by everyone. This may be as a result of those definitions being given by scholars from different disciplines (library and information science, health communication, health education, marketing *et cetera*). Therefore, researchers in the same field look at the concept through acceptable lenses by fellow researchers. However, due to the variation in agreement on some concepts, there is the need to explicitly outline them in order to provide a better understanding of what exactly a particular research is attempting to examine and measure in a specific context**.**

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Based on the above, the first step in the literature review would be to understand how scholars have defined health information seeking behaviour.

Wilson (2000) defines information seeking as "the purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as the World Wide Web)".

Warner and Procaccino (2004) define health information seeking behaviour as "a process of seeking information needed for personal decision-making related to health and medical issues". Similarly, Lambert and Loiselle (2007) define health information seeking behaviour as "ways in which individuals go about obtaining information, including information related to their health, health promotion activities, risks to one's health and illness".

From the reviewed definitions, conclusions can be made that most scholars are in agreement and stress that information seeking involves the "active or purposive" efforts instigated by individuals to "acquire" or "obtain" a specific needed "information" from "outside sources" or carriers of exact information when information stored in memory is not enough to satisfy a need or gap in one's knowledge. In the next section, a number of variables that influence health information seeking among graduate students were reviewed with a cue from the CMIS and related literature.

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## 2.3 Factors that Influence HISB on the Internet

The Johnson's (1997) Comprehensive Model of Information Seeking (CMIS) which was adopted for the study has three primary classes of variables. These are: antecedents, information carrier factors, and information seeking actions.

Antecedent to health information seeking for the purpose of the study are essentials that "motivate people to seek answers to questions and shape their views about the usefulness of information sources". The CMIS uses two main types of antecedents from uses and gratifications (U&G) and health belief model (HBM) viewpoints: background factors (demographics and experience) and personal relevance factors (salience and beliefs) (Johnson, Donohue, Atkin, & Johnson, 1995).

### 2.3.1 Background Factors

Researchers have identified and explored numerous important demographic and socioeconomic factors in the health information seeking behaviour context with regard to their personal experience within the motivational or psychological approach to information seeking.

#### 2.3.1.1 Demographic Factors

Some of the demographic factors that have been studied by researchers in association with the information seeking behaviour of individuals include gender, age, income and discipline.

Andualem, Kebede, and Kumie (2013) conducted a research on assessing information needs among Ethiopian health professionals using descriptive statistics

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and multivariate regression analyses to assess the association between a factor and an outcome variable. The findings indicated that majority of the respondents acknowledged the need of health information in their routine activities. Age, sex, income, computer literacy and access, patient size, work experience and working site were significantly associated with information needs and seeking behaviour.

Rahman, Kielmann, Mcpake, and Normand (2012) explored the context, reasons, and choices in patterns of healthcare-seeking behaviour among 218 men, women, adolescent boys, and girls in Bangladesh to present the obstacles and challenges faced in accessing healthcare provision in the tribal areas. Among the four main findings that emerged from the study, gender and age played a role in decision making in relation to health matters and treatment-seeking.

However, a number of studies done recently have revealed that demographic characteristics such as age, gender, and discipline forecast variances in the use of various health related information resources (de Groot, 2010; Rahman et al., 2012; Ansah-koi, 2013; Abedi, Ashrafi-Rizi, Zare-Farashbandi, Nouri, & Hassanzadeh, 2014). The review would however focus on gender and age as they are well suited to this study's objectives and reasons for using the Internet for health information and one's ability or experience to use the Internet as experience factors.

#### 2.3.1.1.1 Gender of Respondents

Gender is a significant factor and one of the demographic features of users that have been examined by many scholars to identify its effect on consumers' behaviour in general and more specifically in their health information seeking behaviour.

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According to Rice (2006) gender was the strongest and most consistent influence on the use of the Internet and how frequent users use the Internet to search for health related information.

Fox and Jones (2009) indicated in the Pew Report that 73 % of males as against 75 % of females use the Internet. Even though the difference in the percentage of men and women who use the Internet is quite small, the report indicated that females are significantly more likely than males to seek for health related information on the Internet than females (Dolan, Iredale, Williams, & Ameen, 2004; Fox, 2005; Fox, 2008) since about 64 % of the female gender searched for health-related information as compared to 57 % of their male counterpart. These figures were even more assured with the most recent findings from the 2010 Pew survey which showed that 65 % of women and 53 % of men reported to have ever looked online for information about health or medical issues (Fox, 2011).

Renahy, Parizot, and Chauvin (2008) also found that, although 73 % of men seemed to have greater access to the Internet than the women (67 %), the difference was not significant. However, women were significantly more likely to have previously searched for health information than men.

According to de Groot (2010), there are no strong correlations between demographic factors and the frequency of health information seeking on the Internet. There is a very moderate negative correlation between gender and the frequency of health related information seeking on the Internet ($r$ = -0.19, $p$ = < 0.01), which means that

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males search the Internet slightly more frequently for health related information than their female counterpart.

A study by Ford, Miller, and Moss (2001) revealed that although some gender differences in computer use exist, there was no association between female gender and low self-efficacy. Therefore, it is not the gender variable that determines the degree of self-efficacy.

#### 2.3.1.1.2 Age of Respondents

Age, according to Tenopir (2003) is a very debatable factor and one that is less conclusive. Younger generations have been brought up with computers but older students may not have had as much exposure to computers resulting in increased computer anxiety. This assertion is affirmed by Renahy *et al.* (2008) who indicated that age is a variable that correlates with use of computers and resources on the Internet. Therefore, Internet access decreased significantly with increasing age and increased with the level of education and income.

Ellison (2001) who shares similar view argues that, the age of an individual influences the use of digital resources and that, it often indicates generational gaps between the respondents. In a review of the relationship between socio-demographic (age, gender, education and job) properties and the use of health information resource, Gavgani, Qeisari, and Jafarabadi (2013) concluded that there is a meaningful-relationship between age and "discussions with family, relatives or close friends" for receiving health information.

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A survey conducted by Cleveland *et al.* (2008) on Chinese in Dallas/Fort Worth and their health information needs showed that, among the 65% participants, majority who were between 25-34 years were interested in updates on medical developments, exercise and diet information on the Internet. This indicates that age group of participants is related to the use of the Internet. Cleveland (2012) however found that, gender, age, years of living in the U.S. by Chinese, and education level did not influence the health related information searching on the Internet.

Rice (2006) also reported that, age was a major factor in the usage of the Internet for health information, implying, the younger the respondent, the more they use the Internet to find the information being sought for online. A user's age influences the use of electronic resources for sourcing relevant information.

Borzekowski, Fobil and Asante (2006) found out that young persons are more likely than their older counterparts to go online. The young people are more adept at using newer technology, more motivated to interact and respond to it because they are open to change. Although, the many concerns on the quality of online health information are real. The ease of access, the anonymity and non-punitive quality of use of the Internet, makes it an attractive information source, especially for sensitive health issues. Ansah-koi (2013) revealed in her study of graduate student in the University of Ghana that the youth reported great interest in Internet use for health information, high levels of efficacy, and positive perceptions of online health information.

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#### 2.3.1.2 Degree of Experience

Apart from the demographic factors, another background factor that the CMIS proposes to have an effect on perception and use of information sources and information seeking is the individual's degree of experience. “Originally, the CMIS focused on individuals experience with disease (i.e., cancer) either personally or someone they know in their social network. Moreover, the CMIS identifies different stages of experience with a disease that would form the nature of information seeking” (Alkhalaf, 2013). In this study, experience or knowledge of using the Internet will represent the degree of experience and would be adopted as one of the factors that could influence university students' perceptions of sources usefulness for seeking health related information.

An individual’s knowledge or experience is considered by different researchers as one of the elements that determine one's ability to search for information (Schmidt & Spreng, 1996). The users’ knowledge of a resource or a service would lead to more use of the service or the resource (Asemi & Riyahiniya, 2007). According to Jones, Johnson-Yale, Millermaier, and Perez (2009), college students use the Internet more than any other group of population. Hinson and Amidu (2006) found that the level of experience of students in Internet and its related applications use was low among final-year students at the University of Ghana Business School. Only 42 % of the respondents positively responded to the use of the Internet. Most of the students reported that they had been introduced to the Internet by friends or family members, while others had learned about it through their own efforts or self-initiative.

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Schmidt and Spreng (1996) are of the view that consumers would seek for the type of information that will satisfy their needs. Therefore, consumer's knowledge about a product may lead them to search for more information. This is because they need specific information to enable them decide on the best choice of sources of information, which will in the long run lead them to engage in more search activities than those with low knowledge.

Therefore, higher product knowledge or experience increases one's capability to control information in terms of selecting what is essential and what should be carefully processed. On the other hand, less experience users or consumers with low product knowledge may encounter some difficulty in controlling information flow and selecting what should be processed better. Therefore, tend to search less and perceive information from sources as less useful.

### 2.3.2 Personal Relevance Factors

Johnson (1997) affirms that an individual's motivation to seek information and its purpose are effected by salience and beliefs. These two factors are related to the relevancy of the disease to the individual. That is, the degree to which the information being sought for is related to ones' need is very important to an individual, also the individual's belief about the effects of the information, indicates how far he or she will be motivated to seek for the information.

According to DeLorme *et al*. (2011), "salience has often been used interchangeably with ''importance,'' ''prominence,'' or ''relevance''. In this study, motive for using the Internet, was chosen to represent salience. Why the Internet was chosen as the

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source of health information represented student's belief dimension. Hoyer and MacInnis (2007) are of the view that, key factors that influence the motive of an individual to undertake different types of activities to a large extent is dependent on the relevancy of that activity and this includes health information seeking.

Research indicates that people typically experience considerable level of importance or need when buying, using, or seeking for information about something that is personally relevant or that they believe have significant consequences and implications on their life (Alkhalaf, 2013).

Johnson's CMIS considers salience, perceived significance or importance of health information, as one of the personal relevance factors that motivates a person to seek for information. Johnson (1997) also believes that salience is equivalent to the concept of motivation as it "provides the underlying motive force to seek information".

Research findings suggest that consumers with a lot of needs are more likely or motivated to perform greater information seeking while consumers with enduring needs are more likely to read about certain product or service and visit websites that have related information to gain knowledge about the product or service on a regular basis (Hoyer & MacInnis, 2007). Therefore, the extent and direction of search performed by a consumer about a particular product, including sources utilised, is based on his or her level of motivation and need for the product.

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### 2.3.3 Information Carrier Factors

Johnson's CMIS suggests that, information seeking is determined by information carrier factors aside the earlier antecedent factors which are initial incentives for individuals to look for information. However, Johnson's CMIS suggested two aspects of the factors that may impact on the nature of a person's information seeking actions: perceived characteristics and perceived utility of information carriers.

The first factor (perceived characteristics of information carriers) considers editorial tone and communication potential as the key factors that reveal users' perception of sources. The editorial tone denotes the individual's perception of the credibility of the source, while communication potential denotes the perception of the individual in terms of which information is presented in relation to the style and one's ability to comprehend.

With regards to the second factor which is related to perceived utility of information carriers, perceived usefulness of the source was considered as the main factor in this aspect.

This study considers perceived credibility, accessibility, accuracy, readability, interactivity, trustworthiness among others as information carrier characteristic factors that influence perceptions of a source usefulness. However, among the characteristics mentioned above this research concentrated more on the following factors: perceived credibility, perceived accessibility, trustworthiness and perceived usefulness of the source, as the factors that would influence the actual use of a source for information seeking.

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Attempts made by researchers to conceptualise sources of information in online news context revealed that scholars have investigated source credibility either from a psychological or ontological perspective. Johnson (1997) relates credibility with trustworthiness and believes that people trust professionals more than media.

According to Eysenbach, Powell, Kuss, and Sa, (2012), the quality of consumer health information on the World Wide Web is an important issue for medicine (Eysenbach, Powell, Kuss, & Sa, 2002). They revealed that, the most frequently quality criteria used include accuracy, completeness, readability, design, disclosures, and references provided. They found that fifty-five studies (70 %) established that quality is a problem on the Internet, 17 (22 %) remained neutral, and 7 studies representing 9 % concluded positively. Positive studies scored significantly lower in search ($P$ = .02) and evaluation ($P$ = .04) methods. However, as a result of the differences in the study methods and thoroughness, quality criteria, study population, and topic chosen, study results and conclusions on health-related Web sites vary extensively.

A 7-point-semantic differential scale that intended to measure accuracy, believability, bias, trustworthiness, and completeness of information provided by different media was used by Flanagin and Metzger (2000). The researchers assessed the perception of users on the credibility of several categories of Internet information source in comparison with similar information in other media like television and newspapers**.** The research findings indicated that the information found via the Internet by users are as credible as those obtained from television,

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radio, and magazines, however, their credibility is not like those obtained from newspapers.

Rains (2007) examined the relationship between perceptions of traditional information sources and use of the Internet to seek for cancer-related information using uses and gratifications theory and the CMIS. One's trust in health information from his or her health care provider, family, and mass media channels were studied as predictors of Web use and the perceived usefulness of the information acquired from health searches**.** Rains (2007) also suggested that health information seekers turn to the Internet as a result of lack of trust in their healthcare providers, or due to the inadequate nature of information from other traditional sources such as family members. This finding suggests that the perceived usefulness of the Internet as a resource to source for health information may possibly be dependent on the quality of the patient–provider relationship**.** The findings further indicate that respondents with low levels of trust in their health care providers were more likely to use the Internet to search for health-related information. However, respondents who turned to the Internet for health information were less likely to perceive the information they obtained from the Internet to be useful.

Holtgrafe and Zentes (2012) used CMIS framework to examine factors that influence the perceived usefulness and the preferred use of the Internet for non-prescription drug information seeking. They found that 'trustworthiness' as a constituent of credibility is one of the proven determinants of perceived usefulness. Their research findings suggest that perceived credibility of online over the counter (OTC) medications information is a significant and positive predictor of perceived

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usefulness and the preferred use of the Internet as a source of OTC medications information. The researchers further examined how trust influences health professionals' view on the use of the Internet as the preferred source of OTC medications information and found a significant negative relationship between these two constructs.

Lemire, Paré, Sicotte, and Harvey (2008) in another study examined factors which are likely to explain respondents' belief in the Internet as a preferred source of personal health information. Among other predictors, the researchers measured perceived credibility of the Internet as source of health information using two items that represent credibility and trustworthiness of information on websites that deals with health related issues. The findings suggests that the use of the Internet as a health-related information source is directly and positively associated with individual's use of a web site on the Internet. The researchers further examined the importance respondents place on trust in different sources of health information such as health professionals' opinion and print media sources and how it influences the use of the Internet to seek for health information personally. They found a significant positive relationship between the two constructs. Apart from perceived credibility, another information carrier factor that is suggested to influence perceptions of source usefulness and the ultimate use of a source for information seeking is perceived accessibility of a source.

According to Johnson (1997), individuals prefer easily accessible sources and seek out information that is mostly accessible. He further stated that accessibility even

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overrides credibility and quality of sources when it comes to information seeking. Accessibility also determines the usage of information from a particular source(s). Earlier research has often mentioned factors such as timeliness, convenience, and unmet needs as reasons behind reliance on the Internet for health-related information (Ho, Eysenbach, & Ferguson, 2010). Diaz *et al.* (2002) reported that participants who did not source for health information from their doctors but rather use the Internet for seeking health related information was explained by their perception of getting advice online as more convenient and less expensive.

Holtgrafe and Zentes (2012) believe that the use of the Internet as a preferred source for health information is influenced by the degree of access to other traditional sources to users. Therefore, whenever users find it difficult to access their health care providers in their most needed period, they tend to rely on other sources such as the Internet to obtain needed information. The findings from their research suggest a negative relationship between the accessibility of doctor supplied information and the preferred use of the Internet as a source for health-related information. Their results did not find a significant association between the accessibility of information supplied by pharmacist and the preferred use of the Internet. The findings from these researches are consistent with the principle of uses and gratifications approach by Blumler and Katz (1974), which postulates that people are goal oriented and they seek out media that best fulfill their needs. This is also in agreement with Zipf's principle of least effort, which posits that "each individual will adopt a course of action that will involve the expenditure of the probable least average of his work, in other words, the least effort" (Alkhalaf, 2013). Therefore, information seekers would utilise the most convenient way to find information they need.

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According to Johnson's CMIS, the influence of perceived usefulness (Utility) of information sources on an individuals' actual use (action) of the sources are related. Utility, a source factor, has been defined as perceived usefulness of the information provided by the medium directly to individual needs (Johnson & Meischke, 1993a; Johnson, Donohue, Atkin, & Johnson, 1995; Johnson, 1997).

Diaz *et al.* (2002) explored perceived usefulness of different sources of health information among 512 patients. The findings of the study revealed that, among the patients, both those who used and those who did not use the Internet for health information seeking ranked physician or nurse as the most useful source of health information. However, the respondents who use the Internet ranked the Internet as the second most useful source while those who do not use the Internet ranked television news as the second most useful source. Therefore indicating that perceived usefulness of the source is directly associated with its use.

Lemire, Sicotte, and Paré (2008) for instance examined perceived usefulness of a health related website as a factor that may explain the reliance on the Internet as a preferred source of personal health information in their study. The findings suggest that perceived usefulness is the key factor associated with use of the site as a preferred source of information. DeLorme *et al.* (2011) also studied perceived usefulness of information sources in an attempt to identify factors influencing selection of sources. To measure perceived usefulness of information sources, participants were asked to rate 20 different sources adopted from previous health information seeking studies using a series of 5-point scales ranging from 1 (not at all useful) to 5 (very useful). The research findings revealed that the use of the Internet

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sources was significantly predicted by perceived source usefulness and no health factor emerged as a significant predictor of the use of Internet as a source of information.

This study surveys Ghanaian graduate students' perceived credibility, trustworthiness, and accessibility on the concepts levels, as characteristics of information sources and how they influence the usefulness as well as the actual use of sources of information for seeking health-related information. This research therefore examines whether or not the usefulness of an information sources and the actual use of sources are impacted by the degree of importance students ascribe to the source characteristics (credibility, accessibility, trustworthiness, accuracy, readability, timeliness *et cetera*). The following section spells out the classification of the Internet among other information sources. It briefly demonstrates the foremost reasons people would prefer to use the Internet as information source as well as the perceived benefits that may inspire them to do so.

## 2.4 Information Seeking and the Internet as a Source of Health Information

The Internet serves as a deluge of health information which covers a variety of health topics, with different levels of depth in content. Among the top three health topics searched online are: a specific disease or medical problem, certain medical treatment or procedure, and exercise or fitness. Searching the Internet for health related information is one of the most common and popular online activities (Harris, 2002; Fox, 2006; Fox & Jones, 2009; Fox, 2011). Research indicate that individuals

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with health queries believe that they can find information on the Internet even though they may not know much about the health related topic (Fox, 2011).

According to Huh, DeLorme, Reid, and Kim (2013), people may have limited information processing capacity therefore rely on few sources, it could be attributed to a reaction to information overload. Alkhalaf (2013) indicated that peoples' limited capacity to process information affects their making of choices based on the possible strategies that are available for consumers to use when making those choices. One of the possible strategies could be the reliance on few information sources in order to avoid information overload therefore be able to cope with the limited processing capacity. There are interesting observations made by researchers on the use of the Internet by health professionals. Younger (2010) found that doctors need online information for clinical care, continuing professional development and patient information.

According to Ybarra and Suman (2008), the Internet is changing health information seekers' attitude to their health care needs. They are of the view that there was no significant difference in the health information seeking behaviour of young and older people when they studied and assessed the reasons behind the actions taken by young and old people and men and women as a result of health information found on the Internet. Their research revealed that, against the popular view of the Internet as a young person's technology, the percentage of 60 years and above was similar to that of young adults or adolescents with regards to the use of the Internet as a health care information resource. The results suggested an unused opportunity with online interventions for older adults. However, as age increases so too does the report of

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frustration with the experience. They further found that, men are more likely to report a positive seeking experience than women. The differences in Internet use failed to explain their observed gender and age differences in the health information seeking experience. They concluded that, across the spectrum of age, gender and Internet skill, and Internet health information seeking appears to enhance the patient-provider relationship.

Flynn, Smith, and Freese (2006) conducted a research to determine the relationship between patient's characteristics and seeking health information on the Internet as well as the timing of these searches in relation to doctor visits. A total of 6,279 respondents aged between 63 to 66 years were involved. Among the total respondents surveyed, one-third of respondents had searched online for information about their own health and health care. Half searched for health information unrelated to their last doctor visit. However, 1/3 searched after a doctors' visit, and 1/6 searched before visiting the doctor. They suggested that there are important differences in the timing of online health information searches by psychological and health characteristics among older adults with Internet access.

Rice (2006) researched on two primary questions: (1) what influences people to seek online health information and (2) what influences their perceived outcomes from having access to this information? The results revealed that the strongest and most consistent influences on ever, or more frequently, using the Internet to search for health information were: gender (female), engaging in other Internet activities, Internet health information seeking including more frequent health seeking, more

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specific health reasons, belonging to an online support group sharing health interests, and helping another deal with an illness or major health condition.

De Leo, LeRouge, Ceriani, and Niederman (2006) studied Physicians' use of the Internet for health information to determine the Internet sources physicians most often use to gather medical information. The study revealed that the enormous majority of physicians indicated they access a targeted site rather than utilise a search engine (such as Google) to gather medical information. Most of the physicians revealed that they used edited/secondary data sources as their primary medical information source; about one quarter of the surveyed physicians surveyed used research databases which provide access to medical journal publications. A minority of physicians use sites dedicated to their specialised area whiles a small percentage use medical web site portals.

Wagner, Bundorf, Singer, and Baker (2005) studied the ways that people who had not previously obtained Internet access use the Internet when it becomes available to them. The researchers in 2001-2002 surveyed 12,878 individuals who were 21 years of age and above. With a response rate of 69 % for Internet health information seekers, the researchers analysed and compared respondents with no prior Internet access with those who with prior Internet access. The results revealed that among those newly provided with free Internet access, 24 % had used the Internet for health information in the past year. The users reported notable benefits, such as improved knowledge and self-care abilities. The no-prior-Internet group reported lower rates of using the Internet (24 %) than the group that had obtained Internet access prior to joining the research panel (40 %), but the 2 groups reported similar perceptions of the Internet

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and self-reported effects. The conclusion was that those who obtained Internet access for the first time used the Internet for health and appeared to benefit from it. Access to the internet assisted in explaining the digital divide, although most people who were given free access did not use the Internet for health information.

Several researchers have focused on the use of the Internet to search for health related information by students (Escoffery et al., 2005; Ivanitskaya, O'Boyle, & Casey, 2006; Kim, Park, & Bozeman, 2011). The findings generally were that students' dependency on search engines was too much. Students also used a trial-by-error approach and did not assess the information found. Ivanitskaya, *et al.* (2006) concluded that several students lack important competencies that may limit their ability to make health decisions.

According to Fox and Jones (2009), many people turn to a health professional, family or friends when they are faced with health queries. However, the individuals use the Internet as a supplementary source of health information. Beard, Wilson, Morra, and Keelan (2009) also observed that the younger generation is more likely to partake in social technologies related to health than their adult counterpart. The users' engagement in health related technological sources may potentially impact on their real life health behaviour.

According to Tu and Hargraves (2003), contrary to the popular belief that most Americans keenly seek health information, especially on the Internet, majority of Americans did not sought health information about a health concern in 2001 as reported in Center for Studying Health Systems Change (HSC) study. The 38% of Americans who sourced health information relied more often on traditional sources

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such as books or magazines instead of the Internet. Also, it was expected that people living with chronic illnesses were more likely to seek health information, yet more than half did not. However, those with a college degree were twice as likely to seek health information as people without a high school diploma. This phenomenon is as of consumers being confronted with more responsibility for making trade-offs among the cost, quality and accessibility of health care. Therefore, credible and understandable information will be very critical in the empowering of consumers to take active roles in managing their health care.

Cline and Haynes (2001) observed that health information seekers apart from benefiting from flexibility and richness of information sources also deal with navigational difficulties and quality problems. Eysenbach and Köhler, (2002) also reported a concern of quality with health information on the Internet. Researchers further observed that misunderstanding or misuse of health information content can have negative impacts on human health and ultimately their lives. Lack of health information competencies limits individuals' abilities to conduct efficient search, to locate accurate information, and to make a good medical decision (Cline & Haynes, 2001; Ivanitskaya, et al., 2006).

A research was conducted by Gavgani, Qeisari, and Jafarabadi (2013) to increase the understanding of the ways that people find health information in Iran as a developing country. Their research was also to evaluate the roles of public libraries in providing their users with health information. The findings revealed that Iranian health information seekers were passive rather than active ones. The most common resources for seeking health information were "TV" and "discussions with others".

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Among the persons who used the Internet to search for health related information, majority of them used search engines such as "Google" or "Yahoo". There was a meaningful-relationship between education level and use of Internet for getting health information. Age and job also associated with "discussions with family, relatives or close friends" for receiving health information. The study suggested that one of the key issues in public libraries could be educating the citizens (its members at least) until people become familiar with available health resources in the library. Also librarians could teach them how to search on authentic websites.

Gatero (2011) explored the availability and utilisation of information and communication technology for accessing health information by medical professionals in Kenyatta National Hospital, Kenya. Using a Grounded theory approach, the study revealed that medical professionals needed information continuously in the course of their clinical work. They mainly turned to colleagues for their health information. Textbooks and journals were also frequently used as sources of information. However, there was a substantial preference for e-searching for information from the Internet and e-journals.

Oyelami *et al.* (2013) investigated Internet pattern usage, awareness, and factors influencing their use of the Internet for self-care health information in Nigeria. With the general inadequacy of healthcare in Nigeria, the researchers used a questionnaire-based assessment to assess 205 individuals selected randomly. The results indicate that 61 % of the participants use the Internet for self-care and were aware of the availability of health information on the Internet. The participants also reported that they have used the Internet for communication, social networking, research and banking purposes. The results validate perceived ease of use, compatibility, Internet

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self-efficacy, and technical support and training as factors to consider in using the Internet for self-care.

A research conducted by Borzekowski, Fobil and Asante (2006), revealed that adolescents between the age group of 15 to 18 years living in Ghana's capital city of Accra use the Internet for searching information in general and includes health information. Using a representative sample of 778 which is made up of in-school adolescents and a convenience sample of out-of-school adolescents completed a detailed media and health information survey. The research findings indicated that 53 % Internet users had sought online health information, and this percentage did not differ significantly by gender, age, ethnicity, or even school status.

Ansah-koi (2013) explored the health seeking behaviour on the Internet by graduate students of the University of Ghana. Grounded in the tradition of human health and information seeking literature, the research was underpinned by two theories: the Health Belief Model and the Information Intents Theory. A sample of 100 students from the medical school, sociology and communication schools filled a questionnaire. Results revealed that most of the respondents searched for health information using search engines among others. The iHub Research on Mobile Internet Usage in Ghana in 2012 also revealed that 19% of sample of the Ghanaian populace from Accra and Sunyani, use their mobile phones to browse the Internet. Ansah-koi further recommended that more research should be conducted on health information seeking behaviour of the youth in developing countries. This study therefore offers exciting data on the potential to deliver health information via the Internet to the Ghanaian populace by studying the health information seeking behaviour of graduate students

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on the Internet in KNUST Ghana. The next section takes a look at the concerns Internet health information seekers have and their level of trust of the information sourced online.

## 2.5 Concerns and Trust of Online Health Information

This new age of health information technology according to Robinson, Patrick, Eng, and Gustafson (1998) has the prospect of providing users with health related information which are specific to their health needs and characteristics. It is however difficult to determine sometimes whether the health information seen online could be trusted or not.

Borzekowski, Fobil and Asante (2006) are of the view that it is not possible to evaluate the extent to which whether health information on the Internet can be trusted. This in their view is as a result of studies on the subject not being consistent with one another. For example, on the contrary many people are also optimistic about the health information on the Internet especially when it comes to enhancing the health of a young population in developing countries like African countries especially Ghana. They are of the view that the primary role of the Internet is to deliver information which in the long run would improve the health of these category of population where access to healthcare is not the best.

In relation to the above issues, the researcher sought to find out whether there are any concerns in relation to seeking for health information on the Internet among graduate students in KNUST. The next heading considers self-diagnosis as one of the issues associated with the use of the Internet by health seekers.

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## 2.6 Health Seekers and Self Diagnosis.

One of the key issues in relation to using the Internet for health related information is self-diagnosis. Researches indicate that quite a large number of health consumers on the Internet use the information acquired online to self-diagnose their health condition or need. According to the results from Health Online in the USA more than one-third of the citizens have sourced for information on the Internet to self-diagnose (Ansah-Koi, 2013).

Citing Ansah-koi (2013), Gretchen Berland, MD, of Yale University is of the view that ones' access to some health related information is not in itself bad. However, one's access to health care and the severity of the symptoms is the issue. This claim is also supported by Dr. Lembit Rägo, the Coordinator of Quality Assurance and Safety at the World Health Organisation. He stated that: "Self-medication products are those not requiring a medical prescription and which are produced, distributed and sold to consumers for use on their own initiative. Responsible self-medication can be used to prevent and treat symptoms and ailments that do not need medical consultation or oversight. This reduces pressure on medical services, especially when these are limited."

Health information produced by peers is also a source for self-diagnosis. This is affirmed by a research conducted by Pew (2010), which found out that among US adults, about 25% have in one way or the other turned to others who have similar or the same health related conditions for information.

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Asenso-Okyere, Anum, Osei-Akoto, and Adukonu (1998) investigated the impact on health care seeking behaviour of the cost-sharing policies introduced in Ghana between 1985 and 1992. Qualitative data was collected from rural and urban health care facilities from health workers and opinion leaders in three districts of Ghana. The research findings indicated that the cost recovery policies had led to an increase in self-medication among the populace and other behaviours aimed at cost-saving. The researchers suggested that user fee exemption criteria needed to be worked out properly and implemented so that the poor and needy are not precluded from seeking health care at hospitals and clinics.

## 2.7 The Impact of Internet Health Information

Internet health information according to Fox and Jones, (2009) has impacted significantly on Internet users' health behaviour. They reported that a total of 60 % of Internet health information seekers have themselves or someone they knew benefited from the medical advice or health information found on the Internet, in making medical decisions, maintaining health, and discussing with doctors.

Fox's (2008) report on e-patients also indicated that about 1 in 10 online health information inquiries made had a major impact on the health care of someone or the way they care for someone else. They further indicated that among 57% of respondents who mentioned that their most recent search had an impact on their health decisions (major or minor), 60% are of the view that the information found online does affect their decision on how to treat an illness or condition; 56% also said that it has changed their overall approach to maintaining their health or the health of someone they help take care of.

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Besides, Fox (2006) reported that over 50% of respondents said that online health searches enable them to ask the doctor new questions, or get a second opinion from another medical doctor. However, 42% of adults said that they or someone they knew had been helped in one way or the other by online health advice. Going online for health related information is a mainstream activity, but only few people are engaged daily or even weekly with online health resources. Research indicate that eighty-one percent of Internet users go online and do things related to health less often than once a week (Fox & Duggan, 2013).

## 2.8 Constraints or Barriers to Information Seeking on the Internet.

Literature reviewed in relationship to students' Internet usage for seeking information and the challenges they faced seemed to intertwine and hence they were combined. Research indicates that several challenges work against university student's use of the Internet.

Researches revealed that language, medical terminology, culture and social economic levels have been identified in Internet health information searching as the barriers to effective health information seeking (Edejer, 2000; Morahan-Martin, 2004)

Bernard, Arnould, Saint-Lary, Duhot, and Hebbrecht (2012) identified the barriers to using the Internet for health information seeking by medical practitioners in France. Using a cross-sectional survey and online questionnaire, the results revealed that most of the respondents who were younger used the Internet to seek information. The main barriers were categorised as follows: related to the physician (lack of knowledge or specific skills); to the practice conditions (lack of time, concerns about relationship with patient, financial non-recognition); and to the information (information overload,

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quality concerns, low relevance, language barrier). The medical practitioners indicated that they wanted more reliable and more relevant documents for daily practice.

In the African perspective, Oyadonghan and Eke (2011) listed the barriers to students use of the Internet as insufficient availability of IT resources, the uncooperative attitude of staff, inadequate training on how to use the Internet, cost of utilisation, obsolete equipment, time constraints, space constraints, irregular power supply and systems failure. Waithaka (2013) reported that some of the barriers to seeking for information on the Internet are few Internet access points, low speed of connection of the Internet, a shortage of time, lack of awareness and inadequate skills which are further complicated by inability to afford the access fee.

A study conducted by Kivuti-Bitok *et al.* (2012) on "Self-reported use of Internet by cervical cancer clients in two National Referral Hospitals in Kenya." identified barriers faced by the patients in the use of the Internet in Kenya. The barriers are: lack of knowledge on how to use computers and lack of access to computers. However, high level of access to mobile phones was also reported by the study which concluded that there was a greater potential to Internet use through Web access via mobile phones

Andualem *et al.* (2013) conducted a research on assessing information needs among Ethiopian health professionals. Their research findings indicated that about 54.0% of respondents lacked access to health information. Their findings further indicated that important barriers to access information were geographical, organisational, personal,

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economic, educational status and time. Another study by Talja and Maula (2003) at the University of Tampere in Finland, reported findings similar to the above studies on problems students faced when using the Internet. The findings included lack of access, lack of knowledge of what is available, conservative attitudes and lack of computer skills as hindrances. This is in agreement with Hinson and Amidu (2005) who reported access limitations and lack of skills as problems for final year students at Ghana's Oldest Business School.

Fordjour, Badu, and Adjei (2011) revealed in a survey of the prospect and challenges of information retrieval by post graduate students of the University of Ghana, Legon that, students from the Social Studies, Science and Arts Faculties encounter challenges in the use of the information retrieval systems to obtain relevant information. The main problems they encounter were frequent disruption of Internet, non-availability of training programmes to educate students on how to use information retrieval tools to obtain relevant information.

Badu (2005) reports on a study to find the extent of awareness and use of the Internet and its resources by academic staff and postgraduate students of the University of Ghana. The research findings indicate that both categories of respondents were fully aware of the Internet and most of its services. However apart from e-mail, frequencies of use of Internet resources were very low. The researcher attributed this to inadequate training. This assertion is also expressed by Adika (2003) among faculty members in universities in Ghana. Adika (2003), however, was of the view that lack of access to the Internet was the major constraint to the use of the Internet.

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According to a survey conducted by Arthur and Brafi (2013) among 600 students from three tertiary institutions in the Sunyani Municipality, Ghana, many of the students believed the cost of access was expensive. Furthermore, poor Internet speed, inadequate number of computers in computer laboratories, and inadequate user skills were observed as the leading constraints to Internet use. Similar concerns in addition to power outage on the use of the Internet are also expressed by Arthur (2001) in his study of "Internet use in second cycle institutions in Ghana: A study of Achimota School"

A research conducted by Borzekowski, Fobil, and Asante (2006), indicate that adolescents living in Ghana's capital city of Accra use the Internet for searching information in general including health related information. Using a representative sample of in-school adolescents and a convenience sample of out-of-school adolescents, seven hundred and seventy eight 15 to 18 year-olds completed a detailed media and health information survey. The research revealed that, physical, cultural, and financial barriers often prevent youth from obtaining appropriate and credible information on the Internet.

## 2.9 Conclusion

This chapter presented the literature review which covered the concepts of health information seeking behaviour, factors that influence health information seeking behaviour on the Internet, information seeking and the Internet as a source of health information, consumers health care services in Ghana, concerns and trust of online health information, health seekers and self-diagnosis, impact of Internet health information, and constraints or barriers to information seeking on the Internet.

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Searching the Internet for health information was one of the most popular online activities especially in the developed countries. The use of online health information impacts the life of people from different background. Theories and models on information behaviour focus on characteristics of users, and provided a foundation to study users' information seeking behaviour. Factors such as Internet experience or self-efficacy and characteristics of the Internet among others influence the decision to adopt or use the Internet to source for health information. However, there are variations in research on age and gender and its impact on health seeking behaviour on the Internet which was less conclusive and debatable. Peoples health information needs connects with information searching which connects searchers' goals or information needs with their information search process and sources. Methods used in the studies of Web search can also apply to online health information research by looking at the characteristics of the Internet (communication media) that informs users to use it.

In Africa and specifically Ghana, health information seeking on the Internet is gradually gaining grounds especially among the younger generation. Ghanaian universities have embarked on providing Internet services on their campuses purposely for academic research. This study however, investigated the health information seeking behaviour on the Internet in Ghana. The study focused on the sources graduate students consult for health information, the types of health information sourced on the Internet, the factors that influence (effects) the choice of the Internet to source for health information, the complex relationship between graduate students demographic (gender and age) characteristics and the health information seeking behaviour on the Internet. The study also looked at whether

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graduate students verify the credibility of the information sourced online. The concerns, problems, barriers or constraints students encounter and time spent on the Internet were also looked at. The next chapter covers the methodology used in the study.

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# CHAPTER THREE

# METHODOLOGY

## 3.1 Introduction

The methodology that was used to undertake this study is presented in this chapter. According to Kothari (2004), methodology is the systematic approach applied to solve a research problem. The process of gaining the understanding on the health information seeking behaviour on the Internet among graduate students in KNUST as well as the validity of conclusions derived is dependent to a large extent on the methodology adopted for the study. The chapter focused on a population of graduate students studying: Sociology, Medicine, Pharmacy and Allied Health. In a nutshell, this chapter includes the research design, population, data collection instruments, method of data collection, ethical considerations and method of analysis and presentation of results.

## 3.2 Research Design

To undertake any successful research, it is necessary for a plan to lay out how the research is carried out. This plan is usually referred to as a research design. Therefore, after the problem has correctly been formulated, a design is developed to provide a layout for the steps in the study. The type and plan used for the research is dependent on the nature of the problem. A research design is a plan which is developed to achieve research objectives or answer research questions. It situates the structure or framework that was used to solve the main research problem. In social science research, several research designs can be adopted. Some of these are: a case study, experiments, surveys, histories, and analysis of archival information (Yin, 2014).

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Leedy (1993; 2001) opines that four questions guide the choice of a research strategy. These are:

- What data are needed?
- Where are the data located?
- How will the data be collected?
- How will the data be interpreted?

Gorard (2013) posits that, there are no intrinsically good or bad research designs. The emphasis on research design is less on how to conduct a type of research than on which type is appropriate in the circumstances. With regard to the objectives of the study, a survey design or strategy (cross-sectional survey) was the most appropriate in providing answers to the research questions. The survey method was employed to aid the collection of quantitative data for analysis. Kumekpor (2002) stressed that, a survey provides an objective quantitative approach to the study of social processes within a well-defined area at a given time, by means of a schedule or questionnaire and the data obtained can be statistically related. Creswell (2003) emphasised that a survey research permits the comparison of responses based on which conclusions can be made.

The quantitative survey research design was adopted because of the following reasons:

- It is credited for its flexibility in asking questions and its analysis of responses.

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- It enables the avoidance of personal bias by researchers since the researcher keeps a ‘distance' from participating subjects and employing subjects unknown to them.
- It provides for a comprehensive examination of people’s attitude towards specific issues.
- It affords the researcher(s) the opportunity to gather broad and quantifiable data.
- It allows gathering of data within a short period of time, and these facilitate a small sample to be selected and then used to generalise the findings of the large group (population).

## 3.3 Population

A population according to Gravetter and Forzano (2003) is the entire set of individuals of interest to a researcher. Kumekpor (2002) opines that a population is the total number of all elements of the phenomenon to be examined that occurs in the area of research. The concept of population according to Busha and Harter (1980) is fundamental to research. They also define population as any set of persons or objects that possesses at least one shared characteristic. Though, the entire population usually does not participate in a research, the knowledge allows generalisations to be made about characteristics, opinions, beliefs, and attitudes of the entire population being studied.

The entire population totalling two hundred and fifty six (256) was considered for the study. Therefore no sample was taken. Table 3.1 shows the breakdown of graduate

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students from the various academic disciplines. The decision not to take a sample for the survey was informed by the fact that the total population could be conveniently covered by the researcher.

**Table 3. 1 Population of Respondents**

| Academic Discipline | Population/Sample size | | |
|---|---|---|---|
| | Male | Female | Total |
| Sociology | 14 | 8 | 22 |
| Medicine | 73 | 34 | 107 |
| Pharmacy | 54 | 29 | 83 |
| Allied Health | 25 | 19 | 44 |
| **Total** | **166** | **90** | **256** |

***Source: UITS, (Tuesday, 21st October 2014)***

### 3.4 Research Instrumentation (Questionnaire)

In accordance with a survey research methodology, this study used the questionnaire as the instrument or measuring tool. According to White (2000), the questionnaire is an important tool, which is useful for obtaining information from informants who are knowledgeable on a specific problem.

According to Saunders, Lewis and Thornhill (2009), the validity and the reliability of data collected by a researcher and the response rate to be achieved is dependant to a large extent on the design and the structure of the questionnaire. The researcher used two approaches in the design of a structured questionnaire for this study: First, majority of the questions were adopted from similar studies. Secondly, other questions were developed by the researcher. The consistency of questions with previous literature was necessary as the researcher intended to replicate or compare the research findings with other studies. It was also more

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efficient and time saving than the researcher developing own questions, as long as the study could still collect the needed data to answer the research questions to achieve the research objectives.

The questionnaire had twenty nine (29) closed ended questions with multiple choice answers which allowed the respondents to tick one or more answer(s) relevant or applicable to them. The questionnaire also had four (4) open-ended questions which allowed respondents to express their views on some issues pertaining to health information seeking behaviour on the Internet, making a total of thirty three (33) questions. The questionnaire was structured into four sections (A-D) along the main lines of the objectives of the study as follows: Section A- focussed on demographic data, Section B covered students' use of the Internet for health information, Section C elucidated questions pertaining to perceptions of accuracy of health information, security, verification and privacy on the Internet and Section D dealt with questions on risk and concerns about online information. The questionnaire was attached as part of the appendices.

The researcher did not pilot the questionnaire. However the researcher used a faculty member, a PhD candidate of the Department of Information Studies and two lecturers from Sociology Department and Medical School respectively to critique the questions and to get feedback about the unambiguity of some of the questions and the easiness with which respondents could complete the survey. Rewording and adjustments, as well as correction of errors were made before the questionnaires were administered. Only one set of questionnaire was administered to the students.

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All questionnaires were self-administered by the respondents in their various lecture halls and or laboratories.

### 3.5 Methods of Data Collection

The success of a research work is largely dependent on the quality of data that is gathered. According to Fraenkel and Wallen (2000), there are basically three modes of data collection in a survey. These are: live administration (face-to-face), administration by telephone, and email. The questionnaire for this survey was live-administered by the researcher at the various lecture halls and or laboratories and was assisted by trained research assistants and course presidents. The course presidents also took part in the survey.

The choice of live administration was informed by its comparative low cost, as well as fast response rate over other modes of administration. The primary data was gathered from the responses of the questionnaire. Also, data from secondary sources were gathered from books, journals, University Information Technology Services (UITS) KNUST, KNUST websites and personal observation.

To facilitate easy access to students and authorities concerned, an introductory letter was obtained from the Department of Information Studies addressed to the registrar's office (KNUST) detailing the purpose of the research. The researcher also provided his cell phone number and e-mail address to facilitate communication with respondents. By this method, copies of questionnaire were administered to the students or respondents in the lecture halls and or laboratories based on their consent to participate in the study. The respondents were given reasonable time (about 20 minutes)

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to complete and return the questionnaire to the researcher or assistants on the same day. A maximum of one week was however, allowed for the return of the questionnaire to the course secretary or president. This helped reduce the non-response rate. The course president facilitated the collection of both completed and uncompleted questionnaire which were subsequently given to the researcher on a designated pick-up date. All completed responses were collected in the first half of March, 2015 and analysed. The questionnaires were analysed using the Statistical Package for Social Sciences (SPSS) version 17.0.

### 3.6 Ethical Considerations

The research was conducted within certain ethical protocols which includes the following:

i. An introduction letter from the Department of Information Studies was presented to the main registry, deans, and heads of departments to enable the researcher conduct the study.

ii. The research participation was completely voluntary.

iii. The researcher ensured that there was no harm to the subjects of the study by ensuring that the information received from the participants were treated as confidential as possible and not used for any other purpose than purely an academic exercise.

iv. Anonymity of respondents was assured by not requesting for their names and any other form of identification.

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v. All scholarly work and data consulted in any form or format were duly acknowledged in reference and bibliography with the help of Mendeley (bibliographic software tool) as appropriate to avoid plagiarism.

vi. Finally, data was not manipulated to achieve results and the University of Ghana code of conduct for research was adhered to.

### 3.7 Method of Analysis and Presentation of Results

Ader (2008) is of the view that analysis of data is a process of scrutinising, cleaning, transforming, and modelling data to highlight useful information, suggesting conclusions, and supporting decision making. Data analysis can be grouped into three: descriptive statistics, exploratory and confirmatory. This research used both descriptive (frequency tables, charts and graphs) and confirmatory data analysis (CDA) known as inferential statistics.

The inferential statistics permit the researcher to present in a statistical format the data that was obtained in the research. This is to facilitate and identify important patterns and make data analysis more meaningful. According to Sekaran (2003), inferential statistics is employed when generalising from a sample to population. The inferential statistics used for the study were: Pearson's Chi-Square ($X^2$), Cramer's V, Relative Importance index (RII), Means and Standard deviation (SD).

Data collected in this study via questionnaires were analysed using the Statistical Package for Social Sciences (SPSS) version 17.0. Cross tabulations generated were used to ascertain the percentages of respondents who selected each alternative for each question based on the objectives of the study.

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The Parson's chi-square test was used to analyse categorical or nominal data (Fraenkel & Wallen, 2000). A Chi-Square($X^2$) with a significant ($p$) level of 0.05 was used to test for association between variables. The relationship between demographic characteristics and health information seeking behaviour on the Internet (usefulness of resources) were also ascertained using Chi-square test.

Cramer's V, a statistical test of strength of association with the degree of strength (value) varying between zero (0) and one (1) was also used. The higher the 'value' of 'Cramer's V', the stronger the strength of the association or relationship between the variables. The following scale was therefore used:

| | | |
|---|---|---|
| Zero (0) to .30 | = | no relationship (0) to weak relationship |
| .31 - .70 | = | moderate relationship |
| .71 - 1.0 | = | strong relationship |

Relative Importance Index (RII) was used to rank factors to ascertain the most and least ranked factors respectively by the respondents with regards to main motive for using the Internet. Lastly, mean and standard deviation was used to ascertain the average value and variation of each response for each variable or item on the Likert scale. This was used to ascertain the usefulness of health information channels and factors that are considered whilst visiting health related website.

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# CHAPTER FOUR

# DATA ANALYSIS AND INTERPRETATION

## 4.1 Introduction

This chapter focuses on the analysis of data and has been analysed and presented under six thematic areas in line with the objectives of the study. The first theme looked at sources graduate students consult for health related information on the Internet. The other five themes covered perceived factors that influence preference for health information sources; type(s) of health related information students search on the Internet; verification of the reliability of health related information sourced online; demographic and Internet-related characteristics of students. Lastly, the risk, constraints and concerns to effective seeking and use of health related information on the Internet.

### 4.1.1 Response Rate

The response rate (completion rate or return rate) in survey research refers to the number of answered questionnaire divided by the total number of administered questionnaires. From the study 256 questionnaires were administered, out of which 198 questionnaires were completed and returned; this corresponds to a response rate of 77.3 % as shown in Table 4.1.

**Table 4. 1: Response Rate for the Study**

| Population Category | Sample Size/Population | Response | |
|---|---|---|---|
| | | Number | Percentage |
| Sociology | 22 | 20 | 90.9 |
| Medicine | 107 | 86 | 80.4 |
| Pharmacy | 83 | 52 | 62.7 |
| Allied Health | 44 | 40 | 90.9 |
| **Total** | **256** | **198** | **77.3** |

***Source: Field survey, 2015***

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The entire study was successful since the response rate was generally high. The high response rate could be attributed to the respondents being convinced that health information seeking on the Internet was highly regarded as a necessity to enhance health education, preventive medicine and maintenance of a healthy lifestyle. The authority note given to the researcher by the Department of Information Studies also facilitated the response from the respondents since they saw the study as academic.

## 4.2 Sources of Health Related Information on the Internet and other Sources

Graduate students were asked to indicate one or more source(s) from which they accessed health information on the Internet as part of the objectives. Table 4.2 shows the result.

**Table 4. 2: Source(s) of HI on the Internet**

| Source(s) | No. | % |
|---|---|---|
| Search Engines and directories (e.g. Google, Yahoo) | 180 | 90.9 |
| Specific/Authorised health Web sites | 80 | 40.4 |
| Online social network group (e.g. Facebook, WhatsApp) | 70 | 35.4 |
| Online Scientific Journal | 51 | 25.8 |
| E-mails | 46 | 23.2 |
| Online advertisements | 27 | 13.6 |

***Source: Field data, 2015***

In Table 4.2, the findings revealed that 180 (90.9 %) respondents used search engines to obtain health information. This was followed by 80 (40.4 %) respondents using specific or authorised health websites. Seventy (35.4 %) of the respondents however used online social networks. Whiles, 51 (25.8 %) of the respondents used scientific journals with 46 (23.2 %) relying on emails and 27 (13.6 %) using online advertisement.

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### 4.2.1 First Option of HI Source

Graduate students were asked to indicate their first option of health information source (Table 4.3).

**Table 4. 3: First Option for HI Source**

| Health Information Source | No. | % |
|---|---|---|
| Internet | 101 | 51.0 |
| Medical Practitioner | 53 | 26.8 |
| Books/Magazines | 33 | 16.7 |
| Friends/Family | 11 | 5.6 |
| **Total** | **198** | **100.0** |

***Source: Field data, 2015***

The results in Table 4.3 revealed that majority of respondents 101 (51.0 %) preferred the Internet as their first option for sourcing health related information. Also, 53 (26.8 %) of the respondents opted for medical practitioners as their first option. Furthermore, 33 (16.7 %) of the respondents opted for books/magazines whiles 11 (5.6 %) opted for Friends/family as their first options for health information respectively.

### 4.2.2 Usefulness of Sources of HI

In general, this study sought to find out the usefulness of the various sources of health related information including the Internet (online). This was to determine respondents' utility (usefulness) of information carriers. According to Johnson's (1997) CMIS, utility is an information carrier factor (the second primary class of factors) which together with information characteristics factor determines information-seeking actions. The respondents were asked to rank the usefulness of the sources on a scale of 1 – 3 (1= Always useful, 2= Sometimes useful, Never useful) (Table 4.4).

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**Table 4. 4: Usefulness of HI Sources**

| Resources or Channels for HI | Category | Mean | SD |
|---|---|---|---|
| Non-advertising Internet sources (e.g., health-related Web sites such as WebMD) | Online | 7.19 | 71.183 |
| Internet advertising sources (e.g., drug brand Web sites, Internet ads) | Online | 7.19 | 70.845 |
| Non-professional interpersonal sources (e.g. friends, relatives) | Offline | 2.79 | 6.897 |
| Print media sources (e.g., magazine articles, newspaper stories) | Offline | 2.37 | 6.931 |
| Direct-to-consumer advertising sources (e.g., newspaper ads, magazine ads, TV and radio commercials) | Offline | 2.26 | .675 |
| Specialized medical materials (e.g., printed materials from drug companies, professional medical publications, printed materials in doctors' offices) | Offline | 2.22 | 6.945 |
| Professional interpersonal sources (e.g. doctors) | Offline | 2.19 | 6.947 |
| Other health care providers sources (e.g., pharmacists) | Offline | 2.16 | 6.938 |
| Social media sources (e.g. Facebook, ask.com, blogs, wikis, YouTube) | Online | 2.08 | .760 |
| **Note: 1=Always useful, 2=Sometimes useful, 3= Never useful** | | | |

***Source: Field data, 2015***

From the mean values generated in Table 4.4, the results revealed that both 'Non-advertising Internet sources' and 'Internet advertising sources' (online) scored the highest mean (7.19). These are followed by 'Non-professional interpersonal sources' (2.79), 'Print media sources' (2.37), 'Direct-to-consumer advertising sources' (2.26), 'Specialized medical materials' (2.22), 'Professional interpersonal sources' (2.19), and 'Other health care providers sources' (2.16) which are 'offline' sources. However, 'Social media sources' scored the lowest mean (2.08) among online sources and all the sources (online and offline). This suggests that, both 'Non-advertising Internet

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sources' and 'Internet advertising sources' (online) were the most highly rated or most ranked health information resources by the respondents.

Having the highest standard deviations (SD), the results suggest that both 'Non-advertising Internet sources' (SD=71.183) and 'Internet advertising sources' (SD=70.845) (online) were the resources respondents found useful most differently. This suggest that the usefulness of a source depends on whether the source would be able to satisfy the health information needs of the individual as stated in Johnson's (1997) CMIS.

### 4.3 Perceived Factors that Influences Preference for HI Sources

This subsection takes a look at the perceived factors that influences the respondents' preference for health information sources.

#### 4.3.1 Perceived Characteristics that Influences Preference for the Internet as HI Source

As part of the objectives of the study, the respondents were asked to select one or more perceived characteristics that influenced them to source for health information on the Internet (Table 4.5).

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**Table 4. 5: Features that Influence HI Seeking on the Internet**

| Characteristics | No. | % |
|---|---|---|
| Source is available any time I need it (provides 24/7 accessibility) | 165 | 83.3 |
| It is fast and requires minimum efforts to obtain information from | 145 | 73.2 |
| It provides information from different sources simultaneously | 137 | 69.2 |
| Lots of very useful information on preventive medicine is available | 99 | 50.0 |
| the source does not involve high cost to obtain needed information | 90 | 45.5 |
| Confidentiality and anonymity is guaranteed | 82 | 41.4 |

***Source: Field data, 2015***

It could be observed from Table 4.5 that 165 (83.3 %) of the respondents selected the Internet because it was accessible every day. One hundred and forty five (73.2 %) respondents also preferred the Internet because it was fast and required minimum effort to obtain information. Also, 137 (69.2 %) respondents said because 'it provides information from different sources simultaneously'. Ninety nine (50.0 %) respondents said because 'lots of very useful information on preventive medicine is available'. Ninety (45.5 %) preferred the Internet as the main source because it cost less to source information from the Internet and 82 (41.4 %) respondents indicated that because confidentiality and anonymity was assured.

### 4.3.2 Reasons for Seeking Health or Medical Information

In general, the study sought to find out the reason for sourcing for health information. The respondents were asked to indicate one or more reasons they sought for health information (Table 4.6).

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**Table 4. 6: General Reason(s) for Sourcing for HI**

| Reason | No. | % |
|---|---|---|
| Because you want general information on healthy lifestyle | 151 | 76.3 |
| To gain a better understanding of the causes, severity and prognosis of a disease | 146 | 73.7 |
| To find information on a specific disease, treatment and drugs/medication | 131 | 66.2 |
| Because I like to search for medical information | 65 | 32.8 |
| Because you have been diagnosed and want to know more about your illness | 32 | 16.2 |
| Because you ran the risk of getting a particular disease | 30 | 15.2 |

***Source: Field data, 2015***

It could be observed in Table 4.6 that, 151 (76.3 %) of the respondents sought for health information because they wanted general information on healthy lifestyle. A high proportion of 146 (73.7 %) respondents indicated because they want to gain a better understanding of the causes, severity and prognosis of a disease. Also, 131 (66.2 %) respondents said because they want to find information on a specific disease, treatment and medication. A significant proportion, 65 (32.8 %) respondents said because they liked to search for medical information. Other reasons were: because they had been diagnosed and wanted to know more about their illness (16.2 %) and because they ran the risk of getting a particular disease (15.2 %).

## 4.4 Type(s) of Health Related Information Sourced on the Internet

As part of the objectives of this study, the respondents were asked to indicate one or more specific type(s) of health information they sourced on the Internet (Table 4.7).

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**Table 4. 7: Types of HI Sourced Online**

| Types of Health Information | No. | % |
|---|---|---|
| General information on healthy lifestyle (e.g. Diet/nutrition, fitness/exercise etc.) | 157 | 79.3 |
| Specific information about a specific disease or treatment (e.g. Ebola, Heart diseases) | 154 | 77.8 |
| Information on the side effects of medications | 128 | 64.6 |
| Information about new developments in the health/medical field | 106 | 53.5 |
| Information about new or alternative treatments | 86 | 43.4 |
| information to assist in selecting a specialist (e.g. Doctors) | 9 | 4.5 |

***Source: Field data, 2015***

The results in Table 4.7 revealed that 157 (79.3 %) respondents indicated that they used the Internet to obtain information on healthy lifestyle. Also, 154 (77.8 %) respondents used the Internet to enquire about specific diseases. A total of 128 (64.6 %) respondents used the Internet for information on the side effect of medication; 106 (53.5 %) respondents used it for 'Information about new developments in the health/medical field'. Lastly, 86 (43.4 %) and 9 (4.5 %) respondents used the Internet to obtain 'information about new or alternative treatments' and 'information to assist in selecting a specialist' respectively.

### 4.5 Trust, Verification of the Reliability of HI Sourced Online

One of the objectives of the study was to find out whether respondents verified the reliability of the health information sourced on the Internet (Table 4.8).

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**Table 4. 8: Verification of the Reliability of Health Related Information Sourced Online and Trust of HI Sourced Online**

| Response | No. | % |
|---|---|---|
| Verify with medical practitioner | | |
| Yes | 86 | 43.4 |
| No | 112 | 56.6 |
| Search before visit to medical practitioner | | |
| Yes | 112 | 56.6 |
| No | 86 | 43.4 |
| Search after seeing a medical practitioner | | |
| Yes | 131 | 66.2 |
| No | 67 | 33.8 |
| Difference in online and Doctors health information | | |
| Yes | 35 | 17.7 |
| No | 127 | 64.1 |
| No Response | 36 | 18.2 |
| Trust | | |
| Yes | 180 | 90.9 |
| No | 18 | 9.1 |
| N is the Total frequency=198 | | |

***Source: Field data, 2015***

Table 4.8 revealed that majority, 112 (56.6 %) of the respondents did not verify the information sourced online with medical practitioners. This suggests that most students did not verify the information sourced online.

The respondents were asked if they searched for health information on the Internet before visiting a medical practitioner. This was to determine if the respondents sought other opinion(s) from the Internet before consulting a medical practitioner. The results in Table 4.8 revealed that majority, 112 (56.6 %) of the respondents searched for health information on the Internet before visiting a medical practitioner. This suggests that majority of students preferred acquiring information about their conditions before

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visiting the doctor. Perhaps they doubted the information acquired online or wanted a confirmation from the doctor.

The respondents were also asked if they usually searched for health information on the Internet after seeing a medical practitioner. The results in Table 4.8 revealed that majority, 131 (66.2 %) of the respondents verified health information on the Internet after visiting a medical practitioner.

The respondents were further asked if the health information they accessed on the Internet for treatment of a disease was different from the treatment prescribed by the medical practitioner. As indicated in Table 4.8, majority, 127 (64.1 %) of the respondent said 'No'. Thirty five respondents (17.7 %) however indicated that there was disparity in the health information sourced online and that from the medical practitioner (offline). There was however 'no response' from 36 (18.2 %) of the respondents. This finding suggests that some health information sourced online might be misleading, more especially if not sourced from credible sources.

The respondents were also asked if they trusted the health information sourced online (Table 4.8). As indicated in Table 4.8, majority, 180 (90.9 %) of the respondents responded in the affirmative meaning that they trusted the information they sourced from the Internet.

### 4.5.1 Important Criteria for Seeking HI Online

To find how respondents' assessed the credibility of the health information they accessed online, the respondents were asked to rate the importance (1= Very

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important, 2= Somewhat important and 3= Not important) of a number of factors or criteria which they would consider if they were to read or access health information on the Internet (Table 4.9).

**Table 4. 9: Ratings of Important Criteria for Health Web Site**

| Factor/ Statement | Mean | Std. Deviation |
|---|---|---|
| Bias | 2.22 | .718 |
| Interactivity | 2.10 | .680 |
| Use of multimedia | 2.01 | .583 |
| Appearance | 1.99 | .672 |
| Quality of links | 1.85 | .708 |
| Ease of navigation of web site | 1.74 | .699 |
| Citation for information | 1.66 | .706 |
| Personal relevance | 1.59 | .637 |
| Currency of information | 1.53 | .635 |
| Confidentiality of personal information | 1.45 | .680 |
| Credibility of author | 1.42 | .572 |
| Accuracy | 1.40 | .521 |
| Comprehensiveness | 1.40 | .531 |
| Readability | 1.34 | .536 |
| Ease of understanding | 1.32 | .520 |

***Source: Field data, 2015***

From the values of the means generated, the results in Table 4.9 revealed that 'Bias' scored the highest mean (2.22) as the criteria that can be used to assess health information websites. This is followed by 'interactivity' (mean = 2.10), 'Use of multimedia' (2.01), appearance (1.99), 'Quality of links'(1.85), 'Ease of navigation of web sites'(1.74), 'Citation for information' (1.66), 'Personal relevance' (1.59), 'Currency of information' (1.53), 'Confidentiality of personal information' (1.45), 'Credibility of author' (1.42), 'Accuracy' (1.40), 'Comprehensiveness' (1.40),

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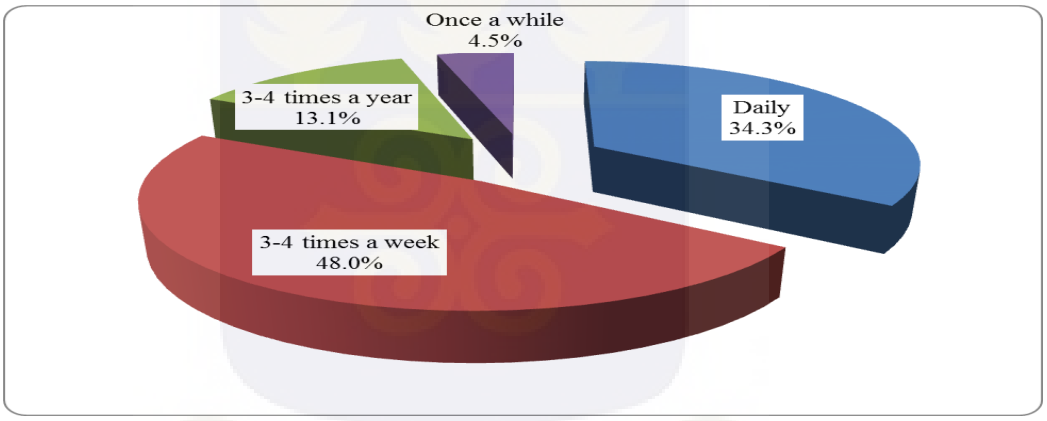
'Readability' (1.34) and 'Ease of understanding' (1.32). The overall findings suggest that 'Bias' with the highest standard deviation (SD=.718) was the most important factor which was differently used to rate the health information websites by the respondents. The respondents were also very familiar with other important criteria to look out for to ensure the credibility of the health information being sourced online.

## 4.6 Frequency of HI Seeking on the Internet

The study sought to find out how frequently respondents sought for health related information online (Figure 4.1).

***Figure 4. 1: Frequency of HI Searches on the Internet***




***Source: Field data, 2015***

As indicated in Figure 4.1, less than half, 95 (48.0 %) respondents out of 198 total respondents revealed they search for information '3-4 times a week'. On a daily bases, 68 (34.3 %) respondents went online for health information whiles 26 (13.1 %) and 9 (4.5 %) respondents revealed searching for health information '3-4 times a year' and 'once a while' respectively. The results show that majority of the respondents often frequented the Internet for health information. These findings could be attributed to

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the respondents having their academic discipline in health related area (health behaviour and health education).

### 4.6.1 Comparison between Type(s) and Frequency of HI Sourced on the Internet

As indicated in the analysis in Table 4.10, the study determined whether there was any relationship between type(s) of health information and frequency of health information sourced on the Internet. To achieve this, the type of health information was crossed tabulated with the frequency of the health information sourced on the Internet.

**Table 4. 10: Type(s) of HI * Frequency of HI Sourced Online**

| Type of Health Information | Significant value (*P*) | Cramer's V value | Remark |
|---|---|---|---|
| General information on healthy lifestyle | 0.000* | .337 | Moderate |
| Specific information about a specific disease or treatment | 0.000* | .326 | Moderate |
| Information on the side effects of medications | 0.000* | .351 | Moderate |
| Information about new development in the health/medical field | 0.000* | .580 | Moderate |
| Information about new or alternative treatments | 0.000* | .370 | Moderate |
| information to assist in selecting a specialist | 0.034* | .209 | Weak |

***Source: Field data, 2015***

The chi-square test indicated that all the six types of sources were significantly ($p < 0.05$) associated with the frequency at which the respondents sourced for health information online. This suggests that the frequency respondents sought for information was dependent on the type of health information the students wanted or needed (Table 4.10). The degree of association was moderate (value> .31) for all but

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one type of health information: 'information to assist in selecting a specialist' which had a weak significant association (value < .30) with frequency of seeking health information on the Internet.

### 4.7 Demographic (Gender and Age) Characteristics

This section focused on demographics (gender and age) characteristics of graduate students and their relationship with other factors or variables.

#### 4.7.1 Gender of Respondents

Gender was relevant to the study as earlier studies have shown that it impacts on the patronage and use of information communication technology systems like the Internet, computers et cetera (Fox & Duggan, 2013). For this reason, the graduate students from the various academic disciplines or respondents were asked to indicate their gender. Table 4.11 depict the gender distribution of the respondents according to the department.

**Table 4. 11: Gender of Respondents *Department**

| Gender | | Department /Academic discipline | | | | Total |
|---|---|---|---|---|---|---|
| | | Sociology | Medicine | Pharmacy | Allied Health | |
| Male | Count | 13 | 53 | 32 | 23 | 121 |
| | % within Department | 65.0% | 61.6% | 61.5% | 57.5% | 61.1% |
| Female | Count | 7 | 33 | 20 | 17 | 77 |
| | % within Department | 35.0% | 38.4% | 38.5% | 42.5% | 38.9% |
| Total | Count | 20 | 86 | 52 | 40 | 198 |
| | % within Department | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

***Source: Field Data, 2015***

As could be observed from Table 4.11, a total of 121 (61.1 %) were males and 77 (38.9 %) were females with the males being the majority across academic discipline: Sociology (65.0 %); Medicine (61.6 %); Pharmacy (61.5 %) and Allied health

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(57.5 %) respectively. The results show that there were more males than females in KNUST. The KNUST Basic Statistics (2014) supports this finding by indicating that about 73.0 % of the population were males.

#### 4.7.1.1. Comparison between Gender and HI Seeking on the Internet

The relationship between how much health information (HI) respondents had sought for on the Internet over the past twelve months for themselves and or someone else and gender of respondents were determined (Table 4.12).

**Table 4. 12: Gender * How much Health Related Information have you tried to get from the Internet for yourself or someone else?**

| | | | Gender | | |
|---|---|---|---|---|---|
| | | | **Male** | **Female** | **Total** |
| How much health related information have you tried to get from the Internet for yourself or someone else in the past 6-12 months? | **A lot** | count | 52 | 41 | 93 |
| | | % within gender | 43.0% | 53.2% | 47.0% |
| | **Some** | count | 41 | 17 | 58 |
| | | % within gender | 33.9% | 22.1% | 29.3% |
| | **A little** | count | 28 | 19 | 47 |
| | | % within gender | 23.1% | 24.7% | 23.7% |
| **Total** | | count | 121 | 77 | 198 |
| | | % within gender | 100.0% | 100.0% | 100.0% |
| Chi-Square value ($X^2$) =3.343[a] | | df = 2 | | Significant value ($p$)= 0.188 | |

***Source: Field data, 2015***

The results in Table 4.12 revealed that among 77 female respondents, 41 (53.2 %) females sourced for 'a lot' of health information on the Internet. Also, among 121 male respondents, 52 (43.0%) males also indicated sourcing for 'a lot' of health information on the internet for themselves.

The Chi-Square test in Table 4.12 revealed that, there was no significant relationship [$p$ (0.188) > 0.05] between gender and the health related information respondents sourced online for themselves or someone else within the past twelve months. The

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finding suggests that, all of the students from all the gender categories were aware and source for health related information from the Internet for themselves or someone else in a similar fashion.

#### 4.7.1.2 Comparison between Gender and Degree of Improvement in Personal Health

The relationship between gender of respondents and use of health information obtained from the Internet was determined. The results in Table 4.13 revealed that among 77 females, 42 (54.5 %) females used 'a lot' of health information on the Internet to improve their health compared with 50 (41.3 %) males among a total of 121 male respondents.

**Table 4. 13: Gender * Degree of Improvement in Personal Health**

| | | | Gender | |
|---|---|---|---|---|
| | | | **Male** | **Female** |
| To what degree has the use of health related information obtained on the Internet improved your personal health? | A lot | Count | 50 | 42 |
| | | % within Gender | 41.3% | 54.5% |
| | Some | Count | 60 | 30 |
| | | % within Gender | 49.6% | 39.0% |
| | Only a little | Count | 9 | 5 |
| | | % within Gender | 7.4% | 6.5% |
| | Not at all | Count | 2 | - |
| | | % within Gender | 1.7% | - |
| **Total** | | Count | 121 | 77 |
| | | % within Gender | 100.0% | 100.0% |
| Chi-Square value ($X^2$) = 4.272[a] df = 3 Significant value ($p$) = 0.234 | | | | |

***Source: Field data, 2015***

The Chi-Square test in Table 4.13 revealed that, there was no significant relationship [$p$ (0.234) > 0.05] between gender and the use of health related information obtained from the Internet to improve personal health.

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#### 4.7.1.3: Frequency of HI Searches on the Internet in Relation to Gender of Respondents

The study determined how frequently respondents sourced for health related information on the Internet in relation to gender. The crossed tabulation result in Table 4.14 revealed that out of 77 females and 121 males respectively, 37 (48.1 %) females and 58 (47.9 %) males sourced for health information on the Internet 3-4 times in a week. Also, 33 (42.9 %) females and 35 (28.9 %) males sourced health information on the Internet daily. More females among the female respondents therefore sourced for health information online more frequently than their male counterpart.

**Table 4. 14: Gender * Frequency of HI Searches on the Internet**

| Frequency | | Gender | |
|---|---|---|---|
| | | **Male** | **Female** |
| Daily | Count | 35 | 33 |
| | % within Gender | 28.9% | 42.9% |
| 3-4 times a week | Count | 58 | 37 |
| | % within Gender | 47.9% | 48.1% |
| 3-4 times a year | Count | 23 | 3 |
| | % within Gender | 19.0% | 3.9% |
| Once a while | Count | 5 | 4 |
| | % within Gender | 4.1% | 5.2% |
| Total | Count | 121 | 77 |
| | % within Gender | 100.0% | 100.0% |
| Chi-Square value ($X^2$)=10.960[a] | df=3 | Significant value ($p$) =0.012 | |
| Cramer's V value = 0.235; | Approx. sig = 0.012 | | |

***Source: Field data, 2015***

The Chi-Square Test in Table 4.14 revealed a weak significant [value < .30; $p$ (0.012) < 0.05] relationship between frequency of sourcing health information online and gender of graduate students of KNUST [$p$ (0.012) < 0.05]. This suggests that knowing

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the frequency of sourcing health information online by students may not necessarily determine the gender.

#### 4.7.1.4 Distribution of the Type of HI on the Internet among Gender

The study sought to find out the type (s) of health information sourced by males and females on the Internet (Table 4.15).

**Table 4. 15: Gender*Type of HI Sourced for on the Internet**

| Type of Health Information Sourced for on the Internet | Gender | |
|---|---|---|
| | **Male** | **Female** |
| General information on healthy lifestyle (e.g. Diet/nutrition, fitness/exercise etc.) | 86 | 71 |
| | 71.1% | 92.2% |
| Specific information about a specific disease or treatment (e.g. Ebola, Heart diseases) | 89 | 65 |
| | 73.6% | 84.4% |
| Information on the side effects of medications | 68 | 60 |
| | 56.2% | 77.9% |
| Information about new development in the health/medical field | 57 | 49 |
| | 47.1% | 63.6% |
| Information about new or alternative treatments | 48 | 38 |
| | 39.7% | 49.4% |
| Information to assist in selecting a specialist (e.g. Doctors, herbalist etc.) | 6 | 3 |
| | 5.0% | 3.9% |

***Source: Field data, 2015***

The results of the cross tabulation in Table 4.15 revealed that higher proportion (49.4 % to 92.2 %) of females within the female gender variable relatively sought for more of the different types of health information online than their male (39.7 % to 71.1 %) counterpart. However, only 6 (5.0 %) out of 121 male respondents indicated that they searched for 'information to assist in selecting a specialist' and 3 (3.9 %) respondents out of 77 female respondents indicated same.

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#### 4.7.1.5: Comparison between Gender and Level of Experience on the Internet

The study determined whether the respondents' level of experience was dependent on gender. The results generally indicated that an overwhelming majority of the respondents were experienced with varying levels of experience in the use of the Internet and common Internet activities (4.16).

The results revealed that 65 (53.7 %) males and 41 (53.2 %) females had some experience with the use of the Internet and its resources. Fifty six (46.3 %) males and 35 (45.5 %) females however indicated that they were very experienced in use of the Internet and its resources. Therefore, indicating a high Internet self-efficacy among the various gender groups of the participants (Table 4.16).

**Table 4. 16: Gender * Level of Experience with the Internet and Use of Resources**

| **Level of Internet Experience** | | **Gender** | |
|---|---|---|---|
| | | **Male** | **Female** |
| Very experienced | Count | 56 | 35 |
| | % within gender | 46.3% | 45.5% |
| Somewhat experienced | Count | 65 | 41 |
| | % within gender | 53.7% | 53.2% |
| Not experienced | Count | - | 1 |
| | % within gender | - | 1.3% |
| **Total** | Count | 121 | 77 |
| | % within gender | 100.0% | 100.0% |
| **Chi-Square value**=1.580[a] | **df= 2** | **Significant value=0**.454 | |

***Source: Field data, 2015***

It is clear from the chi-square test in Table 4.16 that there was no statistically significant association [p (0.454)>0.05] between gender and level of Internet experience. The finding shows that almost all of the students from all the gender categories had Internet experience. This means that males and females have Internet

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experience and use online resources similarly. Maybe as a result of training programmes organised for graduate students in KNUST.

#### 4.7.1.6 Comparison between Gender and Beneficiaries of the HI Sources Online

The study sought to compare gender of the respondents with the beneficiaries of health information sourced on the Internet (Table 4.17).

**Table 4. 17: Comparison between Gender and Beneficiaries of the HI Sources Online**

| Beneficiaries of health information sourced online | Gender | |
|---|---|---|
| | Male | Female |
| Yourself | 103 | 62 |
| | 85.1% | 80.5% |
| Friends | 46 | 37 |
| | 38.0% | 48.1% |
| Client/General Public | 40 | 14 |
| | 33.1% | 18.2% |
| Parents | 25 | 25 |
| | 20.7% | 32.5% |
| Spouse | 6 | 7 |
| | 5.0% | 9.1% |
| Children | 4 | 7 |
| | 3.3% | 9.1% |
| Siblings | 2 | - |
| | 1.7% | - |

***Source: Field data, 2015***

The results indicated that men sought for more health information on the Internet for themselves (85.1%), client (33.1%) and siblings (1.7 %) than their female counterpart. However, females sought for more health related information for their friends (48.1 %), parents (32.5 %), spouses (9.1 %), and children (9.1 %) than their male counterparts as indicated in Table 4.17.

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#### 4.7.1.7 Comparison between Gender and Trust of online HI

The study sought to find out the relationship between gender and trust in health information sourced on the Internet (Table 4.18).

**Table 4. 18: Comparison between Gender and Trust of Internet HI**

| | | | Gender | |
|---|---|---|---|---|
| | | | Male | Female |
| Do you trust the information you source online? | Yes | Count | 105 | 75 |
| | | % within gender | 86.8% | 97.4% |
| | No | Count | 16 | 2 |
| | | % within gender | 13.2% | 2.6% |
| Total | | Count | 121 | 77 |
| | | % within gender | 100.0% | 100.0% |
| Chi-Square value ($X^2$) = 6.429[a] df = 1 Significant value ($p$) = 0.011 | | | | |
| Cramer's V= 0.180; Sig = 0.011 | | | | |

***Source: Field data, 2015***

The cross tabulation results in Table 4.18 indicated that 75 (97.4 %) female respondents trusted health information sourced online than their 105 (86.8 %) male counterparts. The chi-square test also revealed a weak significant relationship [$p$ (0.011) < 0.05, Cramer's V=0.180] between gender and trust of health information on the Internet.

#### 4.7.1.8 Comparison between Gender and Differences in HI Sourced Online from Treatment Prescribed by Medical Practitioner

The study explored whether the respondent's response to the differences in the health information sourced online being different from the treatment prescribed by the medical practitioner had any relationship with their gender (Table 4.19).

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**Table 4. 19: Gender * Differences in HI Sourced Online from Treatment Prescribed by Medical Practitioner**

| | | | Gender | |
|---|---|---|---|---|
| | | | **Male** | **Female** |
| Is the health information on the Internet different from the treatment prescribed by the medical practitioner? | Yes | Count | 26 | 9 |
| | | % within gender | 21.5% | 11.7% |
| | No | Count | 75 | 52 |
| | | % within gender | 62.0% | 67.5% |
| | NA | Count | 16 | 13 |
| | | % within gender | 13.2% | 16.9% |
| | No Response | Count | 4 | 3 |
| | | % within gender | 3.3% | 3.9% |
| Total | | Count | 121 | 77 |
| | | % within gender | 100.0% | 100.0% |
| Chi-Square value ($X^2$) = 3.259[a] df = 3 Significant value ($p$) = 0.353 | | | | |

***Source: Field data, 2015***

The results revealed that majority of both 75 (62.0 %) males and 52 (67.5 %) female respondents indicated 'No'. However, 26 (21.5 %) males and 9 (11.7 %) females affirmed that, there were differences in the information sourced online and doctors diagnosis and prescription. This suggests that sourcing for health information from unreliable sources on the Internet could be harmful if not verified with medical practitioners (Table 4.19). There was no significant relation [$p$ (0.353) > 0.05] between gender and differences in health information sourced online and that of the medical practitioner. Meaning, both males and females indicated the difference in information on the Internet and the information from medical practitioners similarly (Table 4.19).

#### 4.7.1.9 Comparison between Gender and First Option of HI Sources

The summary from the cross tabulation in Table 4.20 revealed that 59 (48.8 %) males and 42 (54.5 %) females opted for the Internet as their first option for health

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information. The medical practitioner followed with 22 (28.6 %) females and 31 (25.6 %) males opting for it as their first option. Also, 27 (22.3 %) males and 6 (7.8 %) females opted for books/magazines as their first option. Lastly, 7 (9.1 %) females and 4 (3.3 %) males opted for friends/family as their first option for health information.

**Table 4. 20: Comparison between Gender and First Option of HI Source**

| | | What is your first option for health information source in general?(Choose ONLY one) | | | | |
|---|---|---|---|---|---|---|
| | | **Internet** | **Books/ Magazines** | **Friends/ Family** | **Medical Practitioner** | **Total** |
| Gender | Male | 59 | 27 | 4 | 31 | 121 |
| | | 48.8% | 22.3% | 3.3% | 25.6% | 100.0% |
| | Female | 42 | 6 | 7 | 22 | 77 |
| | | 54.5% | 7.8% | 9.1% | 28.6% | 100.0% |
| Pearson Chi-Square value=9.251[a] df= 3 Significant value (p)=0.026 | | | | | | |
| Phi=0.216; Cramer's V=0.216; Approx. sig. =0.026 | | | | | | |

***Source: Field data, 2015***

The analysis revealed a weak significant relationship [*p* (0.026) <0.05, Cramer's V (0.216) <0.3] between gender and first option of health information in general. This showed a weak variation in the first choice of different sources for health information among gender (Table 4.20).

### 4.7.2 Age of Respondents

Age is one of the relevant demographic characteristics of the study. Earlier studies have shown that it influences the patronage and use of information communication technology systems like the Internet to seek for health information (Borzekowski, Fobil & Asante, 2006). For this reason, the graduate students from the various academic disciplines were asked to indicate their ages (Table 4.21).

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**Table 4. 21: Age of Respondents**

| Age | No. | % |
|---|---|---|
| 22-25 years | 62 | 31.3 |
| 26-29 years | 58 | 29.3 |
| 30-33 years | 35 | 17.7 |
| 34-37 years | 23 | 11.6 |
| 38-41 years | 7 | 3.5 |
| 42 years and Above | 13 | 6.6 |
| **Total** | **198** | **100.0** |

***Source: Field Data, 2015***

Table 4.21 shows the age distribution of the respondents from all the academic disciplines. Out of the sampled health information seekers, majority were within the age bracket of 22-29 years, while the minority were 30 years and above.

#### 4.7.2.1 Comparison between Age and Frequency of HI Searches on the Internet

The study sought to found out if there were any differences in the frequency of health information searches on the Internet and the age of the students (Table 4.22).

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**Table 4. 22: Age * Frequency of Health Information Searches on the Internet**

| | | Frequency of health information searches on the Internet | | | | |
|---|---|---|---|---|---|---|
| | | Daily | 3-4 times a week | 3-4 times a year | Once a while | Total |
| Age | 22-25 years | 34 | 12 | 15 | 1 | 62 |
| | | 50.0% | 12.6% | 57.7% | 11.1% | 31.3% |
| | 26-29 years | 24 | 29 | 1 | 4 | 58 |
| | | 35.3% | 30.5% | 3.8% | 44.4% | 29.3% |
| | 30-33 years | 9 | 25 | 1 | - | 35 |
| | | 13.2% | 26.3% | 3.8% | - | 17.7% |
| | 34-37 years | 1 | 17 | 3 | 2 | 23 |
| | | 1.5% | 17.9% | 11.5% | 22.2% | 11.6% |
| | 38-41 years | - | 5 | 2 | - | 7 |
| | | - | 5.3% | 7.7% | - | 3.5% |
| | 42 years and Above | - | 7 | 4 | 2 | 13 |
| | | - | 7.4% | 15.4% | 22.2% | 6.6% |
| Total | | 68 | 95 | 26 | 9 | 198 |
| | | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Chi-Square value($X^2$)=67.549[a] df = 15 Significant value ($p$)=.000 | | | | | | |
| Cramer's V= 0.337 Sig=0.000 | | | | | | |

***Source: Field data, 2015***

Table 4.22 revealed that 34 (50.0 %) of the respondents between 22-25 years indicated that they sought for health information on the Internet on a daily basis. Also, 29 (30.5 %) of the respondent within 26-29 years said they frequent health information 3-4 times in a year.

The cross tabulation in Table 4.22 revealed that there was a moderate statistical significant association [$p$ (0.000) < 0.05; Value (0.337) > 0.31] between age of respondents and the frequency of searching for health information on the Internet. This means that frequency of health information searches on the Internet significantly depends on the age of respondents. The finding shows that some of the students from some of the age (22-29 years) categories frequently search for health information on

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the Internet than the rest of the categories. This may be attributed to this age group (22-29 years) being among the younger category who are the majority of the graduate students' population.

#### 4.7.2.2 Comparison between Age and Level of Internet Experience

The study sought to find out whether the respondents' level of experience in the use of the Internet was dependent on the age of the respondents (Table 4.23).

**Table 4. 23: Age * Level of Experience with the Internet**

| | | | What is your level of experience with the Internet and use of common Internet activities? | | | |
|---|---|---|---|---|---|---|
| | | | **Very experienced** | **Somewhat experienced** | **Not experienced** | **Total** |
| Age | 22-25 years | Count | 33 | 29 | - | 62 |
| | | % within. Age | 53.2% | 46.8% | - | 100.0% |
| | 26-29 years | Count | 31 | 27 | - | 58 |
| | | % within Age | 53.4% | 46.6% | - | 100.0% |
| | 30-33 years | Count | 13 | 22 | - | 35 |
| | | % within Age | 37.1% | 62.9% | - | 100.0% |
| | 34-37 years | Count | 7 | 15 | 1 | 23 |
| | | % within. Age | 30.4% | 65.2% | 4.3% | 100.0% |
| | 38-41 years | Count | 4 | 3 | - | 7 |
| | | % within Age | 57.1% | 42.9% | - | 100.0% |
| | 42 years and Above | Count | 3 | 10 | - | 13 |
| | | % within Age | 23.1% | 76.9% | - | 100.0% |
| Total | | Count | 91 | 106 | 1 | 198 |
| | | % within Age | 46.0% | 53.5% | .5% | 100.0% |
| Pearson Chi-Square value ($X^2$)=16.188[a] df = 10 Significant value ($p$) = 0.094 | | | | | | |

***Source: Field data, 2015***

The results revealed that, all the respondents were experienced with varying levels of experience in the use of the Internet and common Internet activities. Thirty three

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(53.2 %) and 31 (53.4 %) of the 'very experienced' respondents were within 22-25 years and 26-29 years respectively. However, only one (4.3 %) respondent within the age bracket of 34-37 years indicated that he or she was 'not experienced' in the use of the Internet and its resources. The finding shows that majority of students from all the age categories were experienced with the Internet and use of common Internet activities.

The cross tabulation results show that there is no relationship [$p$ (0.094)>0.05] between the age of students and their level of Internet experience and the usage of its resources. This suggests that graduate students level of experience in the use of the Internet is not dependent on their age.

The reason maybe because KNUST graduate students are given regular training on how to seek for relevant information on the Internet via workshops and training programmes (Table 4.23).

#### 4.7.2.3 Association between Age and First Option of HI Sources

The analysis in Table 4.24 indicated that majority of respondents between 22 year and 33 years olds use the Internet as their first option to source for health information. Whiles, those between 34-37 years used books/magazines as their first choice to source for health related information. However, 38-41 years and above opted for medical practitioners (46.2 %) as their first source.

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**Table 4. 24: Association between Age and First Option of HI Sources**

| | First Option for Health Information Source in General | | | | |
|---|---|---|---|---|---|
| **Age** | **Internet** | **Books/ Magazines** | **Friends/ Family** | **Medical Practitioner** | **Total** |
| 22-25 years | 42 | 13 | 2 | 5 | 62 |
| | 67.7% | 21.0% | 3.2% | 8.1% | 100.0% |
| 26-29 years | 29 | 4 | 2 | 23 | 58 |
| | 50.0% | 6.9% | 3.4% | 39.7% | 100.0% |
| 30-33 years | 24 | 1 | - | 10 | 35 |
| | 68.6% | 2.9% | - | 28.6% | 100.0% |
| 34-37 years | 2 | 13 | 3 | 5 | 23 |
| | 8.7% | 56.5% | 13.0% | 21.7% | 100.0% |
| 38-41 years | 1 | - | 2 | 4 | 7 |
| | 14.3% | - | 28.6% | 57.1% | 100.0% |
| 42 years and Above | 3 | 2 | 2 | 6 | 13 |
| | 23.1% | 15.4% | 15.4% | 46.2% | 100.0% |
| Total | 101 | 33 | 11 | 53 | 198 |
| | 51.0% | 16.7% | 5.6% | 26.8% | 100.0% |
| Pearson Chi-Square ($X^2$)=79.027[a] df=15 Significant value ($p$)=0.000 | | | | | |
| Cramer's V=0. 365 ; Sig=0.000 | | | | | |

***Source: Field data, 2015***

The Chi-Square Test in Table 4.24 revealed a moderate significant relationship between age of respondent and first option for sourcing health information [Cramer's V value (0.365) > .3, $p$ (0.000) <0.05]. This means that, the choice of the first option for health information varies with the age of the respondent. Suggesting that, students' first option for health information sources significantly depends on the age of respondents.

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#### 4.7.2.4 Association between Demographic (Gender and Age) Characteristics of Respondents and HISB

One of the objectives of the study was to determine whether some demographic characteristics of respondents (gender and age) are associated with health information seeking behaviour (Table 4.25).

**Table 4. 25: Association between Demographic Characteristics (Gender and Age) of Respondents and Using of HI Channels and Resources**

| Sources of Health Information | Demographic | $X^2$ | df | P | V | R |
|---|---|---|---|---|---|---|
| **Online** | | | | | | |
| Internet advertising sources (e.g., drug brand Web sites, Internet ads) | Gender | 3.070[a] | 3 | 0.381 | | NS |
| | Age | 48.817[a] | 15 | 0.000* | .287 | W |
| Social media sources (e.g. Facebook, ask.com, blogs, wikis, YouTube) | Gender | 2.164[a] | 2 | 0.339 | | NS |
| | Age | 21.421[a] | 10 | 0.018* | .233 | W |
| Non-advertising Internet sources (e.g., health-related Web sites such as WebMD) | Gender | 10.677[a] | 4 | 0.030* | .231 | W |
| | Age | 35.665[a] | 20 | 0.017* | .212 | W |
| **Offline** | | | | | | |
| Print media sources (e.g., magazine articles, newspaper stories) | Gender | 4.344[a] | 3 | 0.227 | | NS |
| | Age | 48.494[a] | 15 | 0.000* | .286 | W |
| Professional interpersonal sources/ University Health Centre (e.g. doctors) | Gender | 6.998[a] | 3 | 0.072 | | NS |
| | Age | 67.546[a] | 15 | 0.000* | .337* | M |
| Other health care providers sources (e.g., pharmacists) | Gender | 3.682[a] | 3 | 0.298 | | NS |
| | Age | 52.744[a] | 15 | 0.000* | .298 | W |
| Non-professional interpersonal sources (e.g. friends, relatives) | Gender | 6.792[a] | 3 | 0.079 | | NS |
| | Age | 40.047[a] | 15 | 0.000* | .260 | W |
| Direct-to-consumer advertising sources (e.g., newspaper ads, magazine ads, TV and radio commercials) | Gender | 8.048[a] | 2 | 0.018* | .202 | W |
| | Age | 35.688[a] | 10 | 0.000* | .300 | W |
| Specialized medical materials (e.g., printed materials from drug companies, professional medical publications) | Gender | 7.801[a] | 3 | 0.050* | .198 | W |
| | Age | 39.747[a] | 15 | 0.000* | .259 | W |

**Pearson's Chi-square=$X^2$ ;Degree of Freedom= df; P= Significant figure, R=Remark; M=Moderate; W=Weak; NS=Not Significant**

***Source: Field data, 2015***

The cross tabulation results in Table 4.25 revealed statistically weak significant relationship [value < .30; $p < 0.05$] between the demographic (age) characteristics of the respondents and usefulness of all the three categories of online health information sources.

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Among gender, no significant deference was found with two of the online resources: Internet advertising sources and Social media sources ($p > 0.05$). However, there was a weak significant relationship with Non-advertising Internet sources (Cramer's V value < .30; p< 0.05).

The findings suggest that one cannot confidently conclude that demographic (gender and age) characteristics of the respondents influence the usefulness of the online resources, since the strength of the relationship was not strong (value < .70).

With the offline or non-Internet resources, age was the only demographic factor that significantly ($p < 0.05$) associated with all six offline resources with various degrees of strength of association (.30> value > .31). The study also found statistically significant relationship between "Gender" and "Direct-to-consumer advertising sources (e.g., newspaper ads, magazine ads, TV and radio commercials)" and use of "Specialised medical materials (e.g., printed materials from drug companies, professional medical publications, printed materials in doctors' offices" (p<0.05) (Table 4.25).

### 4.7.3 Internet-Related Characteristics of Respondents/ Internet Self-Efficacy

The level of Internet experience of respondents was determined to ascertain their level of self-efficacy. The ability to use the Internet determines the ability for one to source for relevant information from the appropriate source on the Internet. In this study, respondents were asked to rate their Internet self-efficacy by choosing between 'very experienced'; 'somewhat experienced' and 'not experienced' (Table 4.26).

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**Table 4. 26: Internet-Related Characteristics of Graduate students**

| **Characteristics** | No. | % |
|---|---|---|
| **Level of experience with the Internet** | | |
| Very experienced | 91 | 46.0 |
| Somewhat experienced | 106 | 53.5 |
| Not experienced | 1 | 0.5 |
| **Hours spent per day on the Internet (Hours)** | | |
| Less than 2 hours | 55 | 27.8 |
| 2-4 hours | 60 | 30.3 |
| 4-6 hours | 53 | 26.8 |
| 6-8 hours | 27 | 13.6 |
| More than 8 hours | 3 | 1.5 |
| Note: N is the Total frequency **(N=198)** | | |

***Source: Field data, 2015***

The summary in Table 4.26 revealed that, almost all respondents had some experience in the use of the Internet. One hundred and six (53.5 %) of the respondents indicated that, they were 'somewhat experienced'. Ninety one (46.0 %) of the respondents indicated they were 'very experienced'. Only 1(0.5 %) respondent indicated 'Not experienced'.

The number of hours respondents spent on the Internet daily was examined to determine how long or frequent users' accessed health information. The results indicated that, majority of the respondents 60 (30.3 %) used the Internet 2-4 hours daily. However, 3 (1.5 %) of the students indicated that their frequency of accessibility or hours spent online was more than 8 hours (Table 4.26).

### 4.7.4 Graduate Students' Main Motive(s) for Using the Internet

As indicated in Table 4.27, the ranks of the factors that motivate graduate students to use the Internet were determined. This was to examine respondents' main motive for using the Internet. A total of six motives were presented to the respondents to rank

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from 1-6, with 1 being the first motive and 6 being the least of motives. The rank was based on relative important index (RII). The RII is given as:

$$\text{RII}=\left\{\frac{6n1+5n2+4n3+3n4+2n5+1n6}{6(n1+n2+n3+n4+n5+n6)}\right\}\times 100$$

Where RII=Relative Important Index

$n1$=Number of respondents who ranked the factors as '1'

$n2$=Number of respondents who ranked the factors as '2'

$n3$=Number of respondents who ranked the factors as '3'

$n4$=Number of respondents who ranked the factors as '4'

$n5$=Number of respondents who ranked the factors as '5'

$n6$=Number of respondents who ranked the factors as '6'

As indicated in Table 4.27, graduate students accessed information on the Internet mainly for research (RII=94.4) purposes, this is not surprising since the main objectives of graduate students was to conduct research for thesis and assignment as found by Badu (2005). Other motives for accessing information include News (RII=64.1), Health (RII=62.0) related information which however was sixth content worldwide (Alkhalaf, 2013), followed by electronic mail (RII=50.8), Socialization (RII=46.0) and lastly entertainment (RII=31.8).

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**Table 4. 27: Ranking of Graduate Students' Main Motive(s) for Using the Internet**

| Characteristics | RANKING | | | | | | | Rank |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | RII | |
| Research | 163<br>82.3% | 19<br>9.6% | 6<br>3.0% | 5<br>2.5% | 5<br>2.5% | -<br>- | 94.4 | 1st |
| News | 19<br>9.6% | 72<br>36.4% | 34<br>17.2% | 32<br>16.2% | 14<br>7.1% | 27<br>13.6% | 64.1 | 2nd |
| Health | 5<br>2.5% | 53<br>26.8% | 68<br>34.3% | 44<br>22.2% | 10<br>5.1% | 18<br>9.1% | 62.0 | 3rd |
| E-mail | 4<br>2.0% | 38<br>19.2% | 32<br>16.2% | 41<br>20.7% | 56<br>28.3% | 27<br>13.6% | 50.8 | 4th |
| Socialization | 3<br>1.5% | 8<br>4.0% | 26<br>13.1% | 76<br>38.4% | 72<br>36.4% | 13<br>6.6% | 46.0 | 5th |
| Entertainment | 5<br>2.5% | 7<br>3.5% | 22<br>11.1% | 10<br>5.1% | 41<br>20.7% | 113<br>57.1% | 31.8 | 6th |

***Source: Field data, 2015.***

## 4.8 The Risk, Constraints and Concerns to Effective Seeking and Use of HI on the Internet.

This subsection examined the risk, constraints and concerns to effective use and seeking of health related information on the Internet.

### 4.8.1 Risk

To ascertain respondent's knowledge or awareness of potential risk the Internet poses to health information seekers, the respondents were asked to select the type of risk they were likely to be prone to when sourcing for online health information.

**Table 4. 28: Kind(s) of Risk(s) to Sourcing for HI on the Internet**

| Risk | No. | % |
|---|---|---|
| Access to potential misleading information | 147 | 74.2 |
| Access to low quality information | 69 | 34.8 |
| Access to incomplete information because of the demand for payment for the information | 66 | 33.3 |
| Access to inaccurate information | 60 | 30.3 |
| Access to potential unreliable information | 54 | 27.3 |

***Source: Field data, 2015***

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Table 4.28 revealed that, a total of 147 (74.2 %) respondents indicated that they were at risk of "Access to potential misleading information". Also, 69 (34.8 %) respondents indicated the risk of "Access to low quality information". Furthermore, 66 (33.3 %) respondents indicated that "Access to incomplete information because of the demand for payment for the information". Moreover, 60 (30.3 %) said "Access to inaccurate information". and lastly 54 (27.3 %) respondents indicated that "Access to potential unreliable information".

### 4.8.2 Constraints to Effective HI Seeking on the Internet

As one of the objectives, the study sought to find out the constraints encountered by the respondent during their online health information seeking (Table 4.29).

**Table 4. 29: Constraints to Effective HI Seeking on the Internet**

| Constraints | No. | % |
|---|---|---|
| Not knowing appropriate sources | 112 | 56.6 |
| Erratic power supply | 109 | 55.1 |
| Denial of access to information due to inability to pay for access to resource(s)/ Hit pay wall | 78 | 39.4 |
| Inadequate finance/high cost of online resources | 59 | 29.8 |
| Limited knowledge of understanding health information | 45 | 22.7 |
| Perceived lack of quality service | 37 | 18.7 |

***Source: Field data, 2015.***

As indicated in Table 4.29, 112 (56.6 %) of the respondents stated that "not knowing appropriate sources" of health information was a major constraint to them. Also, 109 (55.1 %) respondents indicated that "Erratic power supply" was a major constraint to them. Furthermore, 78 (39.4 %) respondents revealed that "Denial of access to information due to inability to pay for access to resource(s)" was a constraint to their health information access. Besides, 59 (29.8 %) of the respondents said "Inadequate finance/high costs of online resources" was their constraints. Lastly, 45 (22.7 %) and

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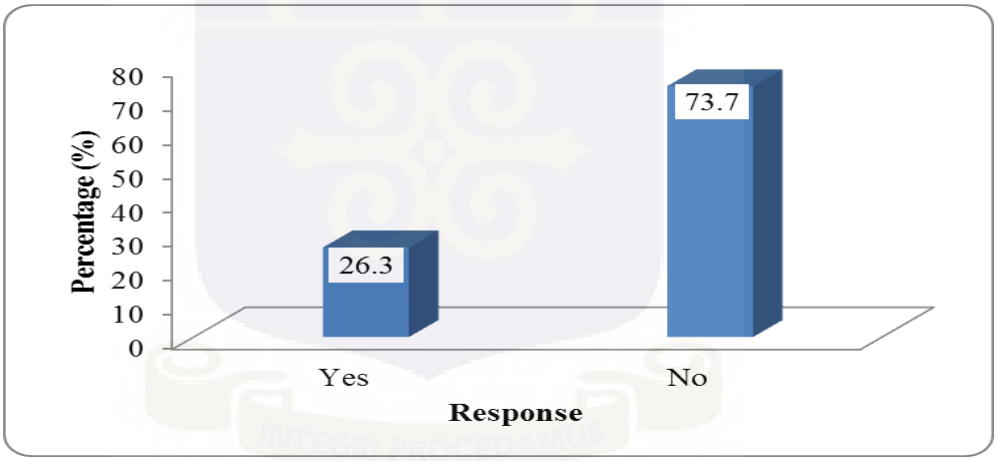
37 (18.7 %) respondents indicated that "Limited knowledge of understanding health information" and "Perceived lack of quality service" were their main constraints when they were sourcing for health related on the Internet respectively.

### 4.8.3 Concerns about HI on the Internet

Respondents were asked to indicate either 'Yes' or 'No' as to whether they had any concerns about sourcing for health information on the Internet. This was to ascertain whether the respondents would not be reluctant to source for health information on the Internet. The result was presented in a bar graph (Figure 4.2).

***Figure 4. 2: Concerns about HI on the Internet.***




***Source: Field Data, 2015***

Figure 4.2 revealed that majority (73.7 %) of the responded indicated that they had no issue with health information found on the Internet. However, minority (26.3 %) of the respondents indicated that they had concerns about health information found online.

The respondents were further asked to state their concerns in relation to online health information (Table 4.30).

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**Table 4. 30: If Yes, please write down your Concern(s)**

| Concerns | No. | % |
|---|---|---|
| Many are misleading and may not apply to all cases | 14 | 7.1 |
| Sometimes the source of the information may not be reliable | 7 | 3.5 |
| Authenticity and accuracy of information | 5 | 2.5 |
| They are usually not comprehensive but excepts only | 5 | 2.5 |
| People who are not health workers find it difficult to understand/ too technical | 5 | 2.5 |
| The demand for payment before access | 4 | 2.0 |
| Access to potential unreliable information. | 3 | 1.5 |
| There are some contradiction in the information sourced from different sources | 3 | 1.5 |
| Sometimes, one wants to ask questions for clarification but that opportunity is not available | 2 | 1.0 |
| Anybody at all can put information on the Internet | 1 | .5 |
| Too much information and had to read a lot before getting some of the information to satisfy my symptoms or situation | 1 | .5 |
| NA | 146 | 73.7 |
| No Response | 2 | 1.0 |
| Total | 198 | 100.0 |

***Source: Field data, 2015***

The summary in Table 4.30 revealed some concerns. The students stated that many of the online health information were misleading and may not apply to all cases. Sometimes the source of the information may not be reliable; authentic and accuracy of information was not guaranteed. Other concerns stated were that, information was not comprehensive; People who are not health workers find it difficult to understand since they were too technical; the demand for payment before access among others.

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### 4.8.4 Comparison between Concerns about HI Sought Online and Verification

The summary in Table 4.31 indicated that 28 (53.8 %) respondents who have concerns do not bother to verify the health information sought online. Whiles, 24 (46.2 %) respondents with online health information concern indicated that they verify the information sought online.

**Table 4. 31: Verification of Information with Medical Practitioner * Concerns about HI Internet**

| | | Do you have any concerns about health information found on the Internet? | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **Total** |
| Do you verify the information with a medical practitioner? | Yes | 24 | 62 | 86 |
| | | 46.2% | 42.5% | 43.4% |
| | No | 28 | 84 | 112 |
| | | 53.8% | 57.5% | 56.6% |
| **Total** | | **52** | **146** | **198** |
| | | **100.0%** | **100.0%** | **100.0%** |

***Source: Field data, 2015***

### 4.9 Recommendations/Suggestions on How HI Needs and Concerns on the Internet can be Addressed.

With regard to recommendations to stakeholders on how students' health needs and concerns can effectively be satisfied and improved via the Internet, the students made some suggestions which when applied could reduce the risk and consequences of sourcing from unreliable sources. The students also suggested some tactics that they believed would help address and overcome the concerns. Some of the methods the respondents stated was that people must consult other specialist for clarification; the information must be authenticated by medical practitioners before they are published

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online. Information must be made simple to the understanding of laymen by adding illustrations; information must be comprehensive and Information sources must be standardised with appropriate citation to prevent misinformation. Country specific health information must be made available since health needs differs from country to country. More online videos, audios and live interactions with Ghanaian medical practitioners must be allowed or made available online. Also, consumer education by health authorities about health information on the Internet should be improved. Any health information sourced online must be verified from health professionals (Medical Doctor, Pharmacist etc.) for authenticity before applied.

Further recommendations were that, information on health must be screened and properly referenced before publishing on the Internet, and consumers must consult only trusted and credible non-advertising websites like WebMD and HON (Health on the net). Lastly, the university authorities must ensure provision of constant power supply and stable Internet connectivity.

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# CHAPTER FIVE

# DISCUSSIONS OF FINDINGS

## 5.1 Introduction

This chapter discussed the main findings with regard to both the research objectives and existing knowledge or literature. This study set out to investigate health information seeking behaviour on the Internet among Ghanaian graduate students at KNUST. Several issues emerged from the analysis of the questionnaires administered to the respondents. The primary objective of this study was to investigate the main sources graduate students used for health related information on the Internet; the types of health related information mostly sought by university students online; whether they verify obtained information.

The study also sought to determine the causal factors that influenced their choice(s) of the Internet as a source of health information; the differences or association between demographic characteristics (gender and age) and health information seeking behaviour on the Internet (usefulness of sources); and to also determine the barriers or constraints to effective use and seeking of health related information on the Internet. In order for the researcher to achieve the overall purpose of this research, the discussion was grouped in accordance with the research objectives as follows:

## 5.2 Sources Graduate Students Use for Health Related Information on the Internet

The study discovered that majority of the students sourced online health information via search engines and directories like Google and Yahoo. This is consistent with

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literature which reported that search engines have been proven to be the main or first point of call for health information seekers on the Internet as found among 86.7 % Chinese students in the USA (Cleveland, 2012).

The Pew Internet Report (2013) also reported that 77 % of online health seekers used search engines such as Google, Bing, or Yahoo. The research finding supported previous researches that suggested that others started their search from specialised health web sites such as WebMD, social network sites like Facebook (Gavgani, Qeisari & Jafarabadi, 2013; Fox & Duggan, 2013), online scientific journals (databases), Emails and online advertisement. The web 2.0 application (social networks, blogs, and discussion groups) were the least used (Gavgani, Qeisari, & Jafarabadi, 2013).

The research finding was contradicted by De Leo, LeRouge, Ceriani, and Niederman (2006) who reported that majority of physicians indicated they accessed a targeted site rather than utilise a search engine (such as Google) to gather medical information. This could be attributed to the physicians' awareness of the specific and credible websites or health information sources.

The survey further revealed that, 93 (47 %) respondents sought for 'a lot' of health information on the Internet which was the first option for most of the respondents for sourcing for health information. Much of the information sought for online in the past six to twelve months was to the benefit of the respondents as well as other people including clients. The research findings are similar to previous studies. Ansah-koi (2013) reported that, 92 (92 %) of health information seekers searched for health

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information for themselves while less than one tenth (8 %) searched for health information for others. Borzekowski, Fobil, and Asante (2006), also reported that majority of Ghanaian youth in the city of Accra regardless of their school status, gender, age, and ethnicity turn to the Internet for health information. In the United States, previous research showed that among young adults, 76 % had gone online to get health information either for personal or school use (Fox & Duggan, 2013). Moreover, a lesser number of Ghanaian graduate students (young adults) had gone online to seek for "a lot" (47 %) and "some" (29.3%) health information in this study, whereas over 81% of college graduates in the US had comparatively gone online for health related information (Fox & Duggan, 2013). The difference between Ghanaian and the US respondents may be attributed to the lack of awareness of sourcing health information online and health information sources in Ghana. In addition, the difference in Internet penetration with Ghana having a little over 20 % Internet penetrations as against 87 % in the USA (Miniwatts Marketing Group, 2013) which needs to be bridged.

The research also revealed that majority of the respondents rated both 'Non-advertising Internet sources' and 'Internet advertising sources' (online) as the most ranked health information resources. Therefore, both 'Non-advertising Internet sources' (*SD* = 71.183) and 'Internet advertising sources' (*SD* = 70.845) (online) were the resources respondents differently found most useful. This suggest that the usefulness of a source depends on whether the source would be able to satisfy the health information needs of the individual as stated in Johnson's (1997) CMIS.

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The research finding contradicted the findings of some researchers on the use of the Internet to search for health related information by students. Their findings generally were that students' dependency on search engines was too much (Escoffery et al., 2005; Ivanitskaya, O'Boyle, & Casey, 2006; Kim, Park, & Bozeman, 2011). This could be attributed to the respondents' awareness of non-advertising Internet sources as credible source of health information.

Respondents were not asked to specify websites they sourced health related information. However, majority of the respondents mentioned, they did not use any specific applications which helped them manage health issues. The research finding is reflective of the study conducted in the University of Ghana where more than 50 % of the respondents responded same (Ansah-koi, 2013). This result partially explains the reason why health information seekers preferred to use search engines for information on health. This result brings to fore the reality of an urgent need for health education with regard to the appropriate, reliable and credible sources of health information on the Internet. The research outcome throws a challenge to stakeholders (e.g. health professionals) in Ghana to come up with credible websites to address health information needs of the Ghanaian populace that patronise the Internet for health information as was suggested in this study.

The results in the study attested to the gradual awareness and growing trends in the health information seeking behaviour on the Internet among young adults in the university. Although the results of this survey cannot be generalised to a larger population, it provides evidence to the awareness and growing trend in the health information seeking behaviour on the Internet among young adults specifically in academia.

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## 5.3 The Perceived Factors that Influences Preference for Internet HI Sources.

The second research question which focused on identifying the factors that influenced students' preference for the health information sources was discussed. The researcher sought to find out why respondents preferred to source for health related information on the Internet; given that there are various potential sources of health information from traditional printed media to the Internet, from friends and family to health professionals. There are also various kinds of health-related Internet sites (Lemire et al., 2008). The characteristics of the information media under the information carrier factors of the CMIS gives an insight into why the Internet was used as a source of health information. The reasons why the respondents use the Internet for health information are deducible from the fact that respondents perceived certain characteristics of the Internet to be conducive.

The results indicated that an overwhelming majority preferred the Internet because it was timely, fast and provided information from different sources simultaneously. Respondents also mentioned that the Internet provided lots of very useful information on preventive medicine; did not cost much to obtain needed information; and also the confidentiality and anonymity of the health information seekers was guaranteed.

The findings corroborates Tu and Hargraves (2003) who found out that 40 % of US health consumers anonymously sourced for health information on the Internet other than the physician. It is consistent with Diaz *et al.* (2002) who revealed that participants who did not source for health information from their doctors but rather use the Internet for seeking health related information was explained by their

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perception of getting advice online as more convenient and less expensive. The findings also corroborates the studies by Cline and Haynes (2001) who gave the reasons for the growth of online health information seeking by consumers to include the cost-containment efforts that reduce physicians' time with patients as well as convenience, anonymity and diversity of information sources as a form of attraction (Holtgrafe & Zentes, 2012). The research findings was similarly supported by Oyelami, Okuboyejo, and Ebiye (2013) and Ansah-koi (2013) in their studies.

It is reported that users rated online support groups more helpful than physicians in numerous ways (e.g. convenience, emotional support, cost effectiveness and in-depth information) (Holtgrafe & Zentes, 2012). This was also reflected in this study whereby the Internet was chosen as the first option for health information by majority of the students. Furthermore, a high proportion of respondents also opted for medical practitioners; books/magazines; friends and family as their first options in the order of decreasing proportions respectively. The difference in options could be attributed to the phenomenon that they went online for health information before consulting the medical practitioner in order to verify the health information. This was indicated by more than half of the respondents. Surprisingly, majority also mentioned that, they went online after consulting the doctor. Perhaps, this is to enable the respondents to be double sure of the information provided by the medical practitioner. It could also be attributed to the overwhelming trust the respondents indicated they had in the Internet as a source for health information notwithstanding the risk associated with sourcing health information online.

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The findings support the study conducted by Flynn, Smith, and Freese (2006) who found out that one-third of respondents in their studies had searched online for information about their own health or health care. Half of these searched for health information unrelated to their last doctor's visit, while 1/3 searched after a visit, and 1/6 searched before a visit.

However, this research finding is contradicted by an observation made by McMullan (2006) that people generally did not consider the Internet as a substitute for consulting health professionals. She was of the opinion that, the Internet was more likely to be considered as a complement to other ways of obtaining assistance or opinions. Notwithstanding "the fact that the medical profession is facing increasing criticism, and that more people are becoming interested in alternative and complementary medicines." McMullan (2006) further revealed that "a study of lay people's attitudes towards the medical profession suggested that most of them still respected physicians and the science behind mainstream medicine".

Cline and Haynes (2001) further stated that relative advantages of online groups are their 24 hour availability, anonymity, selectivity in responding, capacity for immediate and time delayed reactions, unlimited volume of participants (including professionals), and exposure to an increased number of opinions, expertise and experience. The lack of non-verbal cues and potential for anonymity create a level playing field with regard to status this was because many demographic and physical differences are hidden.

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The research further revealed that majority of the respondents sought for health information because they wanted to: live a healthy lifestyle; to also gain a better understanding of the causes, severity and prognosis of a disease as well as find information on a specific disease, treatment and medication. Other reasons were the respondents' special interest in searching for medical information, perhaps on the Internet; ailment or illness and the risk of getting a particular disease.

The results support Johnson's CMIS, which posits that individuals who possess specific background and personal relevance factors and have positive perception of information source characteristics perceives it to have greater utility which in turn will increase the scope and depth of use of such a source under investigation. The preference of the medium is concerned with what the individuals associate the sources in terms of usefulness (Alkhalaf, 2013).

The preference of the Internet may also be due to the level of trust that the respondents had in the Internet. Almost all the respondents had trust in health information sourced on the Internet and indicated they would use the Internet as a source of health information for so many reasons. The choice between the Internet and the medical professional or other health information sources remains unclear. It was indeed observed by Lupton (1997) that, there exist constant tension between consumers' desire to make personal choices (in the spirit of consumerism) and, at other times, a heartfelt desire to invest their trust and hopes in their health professionals, given the reality of an illness marked by suffering, fear and anxiety. Baker, Wagner, Singer, and Bundorf (2003) in a similar study revealed that the

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influence of personal health on one's attitude and behaviour as an Internet user affects their decision or choices. Rains (2007) also revealed that respondents with low levels of trust in their health care providers were more likely to use the Internet to search for health-related information. However, respondents who turned to the Internet for health information were less likely to perceive the information they obtained from the Internet to be useful.

The inferential statistics (mean and standard deviation) results of this study revealed that both 'Non-advertising Internet sources' (SD=71.183) and 'Internet advertising sources' (SD=70.845) (online) were the resources respondents found useful most differently. These findings suggest that the usefulness of a source depends on whether the source would be able to satisfy the health information needs of the individual.

The result is consistent with Johnson's (1997) CMIS, which postulates that there are influential differences between the perceived usefulness of sources and information seeking actions (Johnson, 1997). Lemire, Paré, Sicotte, and Harvey (2008), also reported that perceived usefulness of the Internet as a preferred source for health information has been found as a major factor associated with the use of specific websites.

The results of the research may be attributed to the variations in the individual's experience in a disease or health information need. The varied individual experience will affect their choice (information seeking action) of a medium to satisfy the need(s) as proposed by Johnson's (1997) CMIS. The CMIS considers the individuals'

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experience in a disease as being one of the influential factors (drawn from health belief model) that could influence the graduate students' perception of usefulness of sources (information carrier factor) for seeking health related information to satisfy health needs (Alkhalaf, 2013).

### 5.4 Type(s) of Health Related Information Students Searched on the Internet

The respondents were asked to indicate the type(s) of health information they sourced for on the Internet. The findings of the survey revealed that, majority (more than 50 %) of the graduate students indicated that, the most common type of health information searched for on the Internet pertained to information on general healthy lifestyle, specific disease or treatment, side effects of medications and Information on new development in the medical field. Less than 50.0% of the respondents sourced for information about new or alternative treatments and information to assist in selecting a specialist. The findings is consistent with Fox and Duggan, (2013) who reported that more than 50 % of young adults between the ages 18-29 years sought for specific disease or medical problem, whilst less than 50% also sourced for certain medical treatment or procedure; food safety; drug safety; how to lose weight or control weight, and any other health related issues. The research finding is also consistent with other studies. Dutta-Bergman (2004) reported that individuals use the Internet for gathering medical news, looking for information about medical services, searching for information about drugs and medications, gathering disease specific information, searching for information about healthy lifestyle, and looking for discussion groups. The individuals do this based on the credibility of the different Internet sources of health information that the individuals consider to be most credible. Rice (2006) also revealed that people seek for health information online because of variety of reasons

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which includes specific health reasons such as diagnosed with new health problem, on-going medical condition, prescribed new medication or treatment, and helping another deal with health issues.

The results of the survey also revealed that out of the six different types or options of health information provided, majority of the students relied on four main types of health information. The result therefore suggests that students relied on more types of health information. The dependence on more types or sources of health information contradicts the findings of Huh, DeLorme, Reid, and Kim (2013) who reported that the dependency of few types of health information may reflect a reaction to information overload. It may point to limitations in human information processing capacity (Alkhalaf, 2013). The choice of more types of health information in this study may be attributed to the health related academic disciplines of the respondents. Since the information sourced may be for both personal use and academic work.

## 5.5 Graduate Students Verification of the Reliability of HI Sourced on the Internet

With regard to the verification of the reliability of health information by graduate students, respondents applied different methods or tactics to verify the health information sourced online. The findings revealed that, majority (74.2 %) of the students were aware of the risk to access potentially misleading health information online. However, the research findings show that only 43.4 % of the students mentioned that they verify the information sourced online with medical practitioner whiles the majority (56.6 %) do not bother to do so. This may stem from the students overwhelming indication of trust in online health information. However, more than

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half of the respondents mentioned that they search for health information on the Internet before (56.6 %) and after (66.2 %) visiting the medical practitioner perhaps to find out or verify if what they sourced online is different from what they sourced from the health practitioner's information. The findings indicate that minority (46.2 %) of those who have concerns tended to verify reliability of online health related information, whiles majority (53.8 %) surprisingly do not bother to do so (Table 4.30).

The findings from this research tend to reinforce prior research that university students have weak propensity to verify the accuracy of the information they retrieve from online sources and that the quality of information provided by those sources are not necessarily important to them (Metzger, Flanagin, & Zwarun, 2003). The finding also raises a disturbing issue that urgently needs action. That is, student's weak tendency together with the proliferation of considerable amounts of poor quality information on the Internet which makes students susceptible to more harms and negative health behaviours and outcomes. This may put students or their relatives in a critical situation as a result of taking any misleading or low quality health information for granted.

Moreover, the weak tendency to verify information and the proliferation of poor quality information brings to fore the need to increase awareness about searching skills among university students as was indicated by over 56 % of the respondents who did not know the appropriate sources for seeking health information. There is therefore the need for awareness campaigns and educational interventions that alert students about the low quality of some online information. Students must be encouraged and advised to verify the reliability and credibility of information they

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find online by sourcing from sites like Health on the net (HON) foundation (www.hon.ch). This site is an example of sites that monitor and rate the reliability and usefulness of medical sites (Nagelkerk, 2006). They are therefore essential to combat and correct this risky situation.

The need to source for health information online is supported by Flanagin and Metzger (2000). They found that information found through the Internet by users are as credible as those obtained from television, radio, and magazines, however, their credibility is not like those obtained from newspapers

## 5.6 Association between Demographic Characteristics of Graduate Students (Gender and Age) and HI Seeking Online

The influence of the demographic characteristics (gender and age) on health information seeking behaviour on the Internet was discussed in the following section.

### 5.6.1 Gender

The findings of the study revealed a weak significant difference ($p < 0.05$; Cramer's $V < .30$) between gender and perceived usefulness of Non-advertising Internet sources (online channel) (Table 4.25). The findings corroborates Lemire *et al.* (2008) who reported that women value the site content more than men. They enjoy its user-friendliness more, and they consider the site more useful than men do. This appears to explain women's extensive use of the websites on the Internet. However, the research findings contradicts a research by Barber *et al.* (2009) who contend that females had a high likelihood than their male counterpart to conform to social pressures because

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they are guided by interpersonal affiliations like friends and families. The results may be attributed to the type of group or population that was studied by the researcher in this research study. The researcher purposively selected academic disciplines whose course of study had health behaviour or and the medical field component as a subject. Therefore, their health information seeking behaviour may be towards both personal and academic purposes. This was indicated by some of the students when they said that, a beneficiary of their health information online was their clientele and themselves.

The overall findings in this study are consistent with most researches that women are significantly more likely than men to go online to find out a possible diagnosis or to seek for health information in general on a healthy lifestyle (Fox & Jones, 2009; Andualem, Kebede, & Kumie, 2013; Fox & Duggan, 2013). The 2010 Pew Survey Report also revealed that 65 % of women and 53 % of men reported having ever looked online for information about health or medical issues (Fox, 2011). Most studies conducted over the years have also reported that women are more likely to use the Internet for a variety of health-related purposes (Rice, 2006; Flynn, Smith, & Freese, 2006; Andreassen et al., 2007). However, it contradicts de Groot (2010); Ybarra and Suman (2008) who found that males more slightly frequent the Internet and report a positive seeking experience for health related information than females.

Overall, more female respondents reported seeking for health-related information compared to males. The research study found that majority of females reported searching for “a lot” of health-related information either for themselves or on behalf of someone else during the past six to twelve months compared to males (Table 4.13).

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This perhaps was due to the significant association [$p$ (0.011) < 0.05] between gender and trust, with more females trusting online health information than their male counterpart. The result is consistent with Lemire *et al.* (2008) who found that women trust Internet health information more than men do.

More females also mentioned that the health information on the Internet was not different from the treatment prescribed by the medical practitioners. The findings can be supporting evidence to previous researches that suggested that women are more likely than men to look for health-related information online (Rice, 2006; Dolan, Iredale, Williams, & Ameen, 2004; Fox, 2005, 2008). This findings could be attributed to women's traditional role as mothers, who often feel responsible for the health and well-being of family members (Renahy, Parizot, & Chauvin, 2008). Therefore, women would be more active than men in searching for information related to personal health (Dolan et al., 2004). However, the findings in this study appear to be consistent with the fact that men are more restrained than women to consult a medical professional or look for professional help when they feel they need it as was found in Broom (2005).

Concerning the type(s) of health information sourced online, five out of six of the various types of health information were sourced by females. For example over 90 % of females sourced for General information on healthy lifestyle which was 20 % more than their male counterpart (Table 4.15). However, the type of information to assist in selecting a specialist was sourced by more males than their female counterpart.

Over 80 % of both males and females looked for health-related information for themselves online perhaps because the men (46.3 %) were very experienced than their

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female (45.5 %) counterpart when it came to the use of the Internet. The inferential statistics (Chi square) however did not show any association between Internet experiences with gender. The findings are consistent with a study by Ford, Miller, and Moss (2001) who revealed that although some gender differences in computer use exist, there was no association between female gender and low self-efficacy or experience. Therefore, it is not the gender variable that determines the degree of self-efficacy or experience on the Internet. Asemi and Riyahiniya (2007) reported that it is rather the users' knowledge of a resource or experience with a service that would lead to more use of the service or the resource. This view was also shared by Schmidt and Spreng (1996) .

The research findings indicate a significant association/difference ($p = 0.012$) between frequency of health information searching on the Internet and gender with more females (42.9 %) sourcing for health information on a daily basis than their male (28.9 %) counterpart. This results was consistent with Rice (2006)**,** who reported that gender was the strongest and most consistent influence on the use of the Internet and how frequent users use the Internet to search for health related information.

### 5.6.2 Age

The findings of the study revealed that the usefulness of all the health information sources (online) were positively ($p \leq 0.05$) associated with the age of the respondents. Therefore the perception of the usefulness of health related information sources being stratified by age of the respondents which was found by Fox (2011); Andualem *et al.*

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(2013) and Fox and Duggan (2013a); Rahman, Kielmann, Mcpake, and Normand (2012) was confirmed.

Beard, Wilson, Morra, and Keelan (2009) supported the use of social technologies by younger generations than their older counterpart for health related information. They also indicated that engagement in health related technological sources may potentially impact on the young folk's real life health behaviour.

The findings also revealed that a great majority of respondents of the study who sought for health information on the Internet were between the ages of 22-29 years. They also mentioned that they were very experienced in the use of the Internet. The findings of the research was in line with the studies conducted by Gavgani *et al.* (2013) and Rice (2006). It explained why majority of those who frequented the Internet on daily basis being within this age bracket (Cleveland et al., 2008).

The frequency of health information searches on the Internet was found to be significantly associated with the age of the respondents [$p$ (0.000) <0.05], which contradicts a research by Lemire *et al.* (2008), who found that there was no significant association between the age of respondents and the frequency of use of the Internet for health information (Cleveland, 2012). It could be attributed to the difference in the categories of population studied. The difference among these results may be explained by the fact that most of the respondents (students) were already frequent users of the Internet (Figure 4.1). However, the other studies generally targeted a far larger spectrum of users in order to identify an eventual gap (Lemire, Paré, et al., 2008).

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Using a search engine is somehow linked with younger age group as observed in this study. Majority of the respondents were within the age bracket of 22-29 years, which is in agreement with Fox and Duggan (2013b) who reported that 82% of online health information seekers were 18-29 years old and they used Google, Bing, Yahoo, or other search engine as compared with 73% of those who were 50 years and older. Therefore, the use of search engines seem to be popular with Ghanaian youth too as found in other studies by Ansah-koi (2013) and Borzekowski, Fobil and Asante (2006).

In the analysis of the relation between demographic characteristics (gender and age) and the use of health information resources (offline), the results concluded that there was some meaningful-relation ($p \leq 0.05$) among the various offline health information resources graduate students consult for their health information.

With the offline or non-Internet resources, 'age' was the only demographic factor that significantly ($p < 0.05$) associated with all six 'offline' resources with various degrees of strength of association (.30> value > .31). The study also found statistically significant relationship between "Gender" and "Direct-to-consumer advertising sources (e.g., newspaper ads, magazine ads, TV and radio commercials)" and use of "Specialised medical materials (e.g., printed materials from drug companies, professional medical publications, printed materials in doctors' offices" ($p<0.05$) (Table 4.25).

All the demographic (gender and age) characteristics of the respondents were significantly ($p < 0.05$) associated with the frequency of searching health related

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information on the Internet. The results reveal that the frequency of searching health information on the Internet could confidently be linked (Cramer's V *value* > .30) to the age of the respondents. However, with Cramer's V less than 0.30, one could be wrong to conclude from the findings that knowing the gender of the respondents, one could determine the frequency at which the respondent would search for health information on the internet.

### 5.7 Constraints/ Barriers to Effective Seeking and Use of HI on the Internet.

Majority of the respondents trusted the Internet as health information source. However, they had various problems and concerns which hindered their sourcing and effective use of the Internet as a source of health related information. These problems support perceived barriers explained under the HBM which is a component of Johnson's (1997) CMIS. The most leading issue that health seekers had with using the Internet for health information was that they had problems with unstable Internet connectivity and erratic power supply. Other problems were inability to pay for access to important health information; most of the health information were provided by institutions in the western world; access to incomplete information; high Internet cost; conflicting views; advertisement popups; information overload; lack of clarity; unorganised information; there was no reference to a data source; information was not detailed; and it was hard finding reference to specific information among others.

The research findings are consistent with a research by Ansah-koi (2013) who reported that the most dominant problem among various ones encountered by health information seekers on the Internet was unstable Internet connectivity. Similarly,

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Bernard, Arnould, Saint-Lary, Duhot, and Hebbrecht (2012) reported in their study that, the main barriers to medical information seeking were related to lack of specific skills, lack of time, information overload, quality concerns, low relevance and language barrier. Waithaka(2013) also reported inability to afford the access fee as well as few points of Internet access, low speed of connection, a shortage of time, lack of awareness and inadequate skills on the part of student. Fordjour, Badu, and Adjei (2011) also reported that the main problems students encounter was frequent disruption of the Internet. Also reported was the non-availability of training programmes to educate students on how to use information retrieval tools to obtain relevant information. similar results were also found by Badu(2005); Arthur and Brafi (2013).

Similarly, Wagner *et al*. (2005) reported that, it took too long for respondents to find information on the Internet. Wagner *et al.* (2005) also reported lack of trust for online health information which contradicts this study. Majority of the respondents in the study revealed an overwhelming trust for online health information (Table 4.8).

## 5.8 Concerns about Online Health Information

The results of this study revealed that some of the respondents had concerns about health related information they find on the Internet. Their concerns mainly revolved around four main aspects: trustworthiness of information its sources, accuracy of information, information overload and the cost of accessing some of this sources that is they hit ‘pay wall’. Similar concerns were raised by Alkhalaf (2013) in his studies.

Respondents who had concerns about health information sourced online were asked to enumerate all the strategies, methods or means they think should be used to address

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these concerns. Among those enumerated, five appeared similar to the fifteen methods/criteria used for verifying reliability and credibility of online health information or factors to consider when sourcing for health information online that were examined in this study (Table 4.9).

Their strategies to mitigate concerns were that Information sources must be standardised with appropriate citation to prevent misinformation; users must consults other specialist for clarification; The information must be authenticated by medical practitioners before they are published online; Information must be made simple to the understanding of laymen by adding illustrations; and The information must be comprehensive (Table 4.30). The findings of the study was consistence with a research by Alkhalaf (2013), who pointed out a number of similar recommendations and strategies that the participants in his study believed would help address and overcome the concerns. Some were: consumer education, asking professional interpersonal sources (e.g. doctors, pharmacists) about online information, checking sponsors of a site to see if there are any competing interests, consulting only trusted and credible non-advertising websites.

These findings revealed that the student populations also have concerns about the low quality of some of the health information on the Internet and are aware of the risk of access to potential misleading information; low quality information; incomplete information because of the demand for payment for the information; inaccurate information; and potential unreliable information online (e.g. Eysenbach, Powell, Kuss, & Sa, 2002; Eysenbach, Powell, Kuss, & Sa, 2012).

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The results also indicate that while a significant number of respondents are cautious about the quality of information they find online, a large number of respondents (73.7 %) do not have any concerns and may not take any precautions to verify health information they find on the Internet (Figure 4.2). This reinforces the need for appropriate policy regulations to ensure and vet the quality and accuracy of health information found online as was suggested by some of the students in the study.

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# CHAPTER SIX

## SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

### 6.1 Introduction

This chapter presents a summary of the findings and conclusions drawn based on the study. Recommendations and suggestions for further research are also mentioned. The purpose of the study was to investigate the health information seeking behaviour on the Internet among graduate students in KNUST.

The following were the specific objectives of the research:

1. To find out sources graduate students consulted for health information on the Internet
2. To identify the perceived factors that influenced preference for the Internet health information sources.
3. To identify the type(s) of health related information students search for on the Internet
4. To find out whether university students verify the reliability of health related information they find on the Internet.
5. To determine any association between demographic characteristics of graduate students (gender and age) and health information seeking behaviour (usefulness of resources and channels online).
6. To identify the constraints to effective seeking and use of health related information on the Internet.
7. To recommend to stakeholders on how students' health information needs can effectively be satisfied.

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The study adopted a quantitative cross-sectional survey design. Graduate students from Sociology (22), Medicine (107), Pharmacy (83) and Allied health (44) academic disciplines totalling 256 were purposively selected for the study. In all 198 of the graduate students responded to the questionnaire which was administered to the entire population. The Statistical Package for Social Sciences (SPSS) was used to analyse the data. The quantitative analysis was used to present results of the study. The study used Johnson's (1997) Comprehensive Model of Information Seeking (CMIS) theory to investigate the graduate student's health information seeking behaviour on the Internet by considering the background factors (gender and age) in association with the utility (usefulness) of the resource and the characteristics of the resource or communication media (Internet).

## 6.2 Summary of Findings

The first objective of the study was to find out sources graduate students used to access health related information on the Internet. From the study, a total of 180 (90.9 %) respondents who sourced online health information did that via search engines and directories such as Google and Yahoo. A total of 80 (40.4 %) respondents sourced from specialized health web sites such as WebMD. Respondents who sourced health information from social networks totalled 70 (35.4 %) whiles a total of 51 (25.8 %) respondents sourced from online scientific journals. However, 51 % of the respondents indicated that the Internet was their first option for health information followed by the medical practitioner.

The second objective of the study was to identify the perceived factor(s) that influenced respondents' preference for the Internet sources for health information.

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Results indicated that an overwhelming total number of respondents thus 165 (83.3 %) preferred the Internet because health information was readily available. A total of 145 (73.2 %) respondents preferred the Internet because it is fast, 137 (69.2 %) also said because it provides information from different sources simultaneously. Moreover, a total of 99 (50.0 %) respondents preferred the Internet because it had lots of very useful information on preventive medicine. Ninety (45.5 %) of the respondents also preferred the Internet because it relatively cheap to obtain the needed information. Lastly, a total of 82 (41.4 %) respondents revealed that the Internet was a preferable choice because it ensured confidentiality and anonymity of health information seekers.

Identifying the type(s) of health related information respondents search on the Internet was the third research objective. The types of health related topics or issues sought for by respondents from the most cited to the least mentioned were as follows: Majority of graduate students 157 (79.3 %) indicated information on general healthy lifestyle; Specific disease or treatment were selected by a total of 154 (77.8 %) respondents; side effects of medications were also selected by a total of 128 (64.6 %) respondents; information on new development in the medical field were moreover selected by a total of 106 (53.5 %) respondents. Lastly, Information about new or alternative treatments was chosen by a total of 9 (4.5 %) respondents as the type (s) of health information sourced from the Internet.

The fourth objective was to find out whether university students verify the reliability of health related information they find through online sources. The findings showed that although, majority, 147 (74.2 %) of the respondents were aware of the risk to access potentially misleading health information online, only 86 (43.4 %) students

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indicated that they verified the information sourced online with medical practitioners whiles 112 (56.6 %) did not bother to do so.

The fifth objective was to determine any association between demographic (gender and age) characteristics of graduate students and health information seeking behaviour (usefulness of Internet resources and channels). Using the Pearson's chi-square test and Cramer's V, the statistical association between the demographic (gender and age) characteristics of the students and health information channels and resources (online sources) used by respondents revealed that there was no significant differences ($p > 0.05$) between gender and Internet advertising sources and social media sources. However, there was a weak significant relationship ($p < 0.05$, *value* < .03) with Non-advertising Internet sources (online).

Age was significantly associated with all the three categories of online health information resources ($p < 0.05$). However, the strength of significance was weak in all three cases (Cramer's V *value* < .30).

The final objective of the study was to identify the constraints/challenges/barriers to effective seeking and use of health related information on the Internet. The challenges/constraints of health information seeking on the Internet among KNUST graduate students ranged from not knowing appropriate sources, erratic power supply, denial of access to information due to inability to pay for access to resource(s) or "Hit pay wall", high cost of online resources (inadequate finance), limited knowledge of understanding health information and perceived lack of quality service.

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## 6.3 Conclusion

The use of the Internet sources for health related information was common among students despite the risk of accessing from unreliable sources. Therefore, any institution or nation that ignores education and policies that ensure the health information sourced by the citizenry via the Internet is credible and reliable is endangering the health and life of its own survival. The purpose of the research was to investigate health information seeking behaviour on the Internet among graduate student in KNUST. It adds to literature on our understanding of the role the Internet plays in public health matters and also informs policy makers and stakeholders about current data on health information seeking behaviour on the Internet in Ghana.

The provision of health related information on the Internet to aid learning, teaching and research has lots of benefits in the health, education and information sector in recent years (Siliquini et al., 2011). Global trends in the application of technology (Internet) in the delivery of health information have transformed the health of the citizenry including young adults across the world especially most developed countries like the USA (Cleveland, 2012). Similarly, it has a great potential to impact greatly on the health of the people in developing countries especially Ghana despite the risk. Health information seeking behaviour on the Internet provides the potential for people especially remote areas to access preventive health related information which could go a long way to change their lifestyle towards healthy living.

The use of the Internet to access health information will not only impact on the healthy lifestyle of the citizenry but will also enable students to undertake informed scientific research on health issues in a timely, efficient, and effective manner without

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physical boundaries. There is therefore the need to alert or educate the Ghanaian populace more especially students towards the health information seeking behaviour on the Internet through a collaborative effort by Ministry of Health, Ghana Health Service, Ghana Education Service and Ghana Medical Association. This is because there are lots of risk or dangers of sourcing health information and usage from the Internet especially from unreliable sources.

The researcher undertook this all-important research after being motivated by the concerns that researchers, information providers, content managers and clinicians have shown with regard to how, where and why individuals or groups (students) obtain health information on the Internet, what particular type(s) of information they prefer, and how the health information sought for is used. The researcher purposively selected graduate students offering programmes related to health from the arts and social sciences (sociology) and sciences (medicine, pharmacy and allied health) to investigate the HISB on the Internet by graduate students in KNUST. The study has demonstrated that almost all the students frequently source for health related information on the Internet from various sources via their computers and mobile phones notwithstanding the risk, for themselves and other people.

It appears that most of the students from the various disciplines seek for health information using search engines, non-advertising Internet sources (egWebMD), and social media. They preferred the Internet because it was timely, fast and provided information from different sources simultaneously. They also indicated that it provided a lot of very useful information on preventive medicine; did not involve

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high cost to obtain needed information; and also ensures the confidentiality and anonymity of the health information seekers.

The type(s) of HI mostly sought for were general information on healthy lifestyle, specific information about a specific disease or treatment, information on the side effects of medications and information about new developments in the health/medical field among others.

Majority of the respondents trusted the online information, however, they had concerns with online health information but most of them do not bother to verify with a medical practitioner.

As for the demographic characteristics (gender and age) of the respondents, only age was found to be influenced by (be an antecedent of) ($p<0.05$) the usefulness or utility of all the online channels and resources (Internet advertising sources, Social media sources and Non-advertising Internet sources). The younger age group (22-29) who represented more than half of the respondents frequently sourced for health information on the Internet than their older category. Perhaps they were more experienced than their older folks.

Gender was also found to be influenced (an antecedent) ($p<0.05$) by Non-advertising Internet sources (eg.WebMD). Females, who represented close to one-thirds of the sample, sourced for a lot of different types of health information on the Internet frequently than males. They trusted Internet Health related information more, and they considered the Internet more useful than men.

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This study suggests that an Internet information resource that offers information for the development of knowledge and skills in personal health that users consider credible may be influential. Further analyses are however essential to understand the extent to which the access to information online actually helps users in managing their own health or the health of a loved one.

In conclusion, the findings indicate that students are aware of the Internet as source of health information. The use of the Internet as a preferred source of health-related information was partially influenced by gender (demographic) and directly influenced mainly by age (demographic), the perceived usefulness of Internet resources, the characteristics of the Internet as a source of health information, the individual's concern for his/her own health, the importance given to the opinions of physicians and other health professionals. Lastly, the trust the respondents have in the Internet as a source of health information.

This findings partially supports Johnson's CMIS, which posits that individuals who possess specific background (demographic characteristics) and personal relevance factors and have positive perception of information source characteristics perceives it to have greater utility which in turn will increase the scope and depth of use of such a source under investigation. The preference of the Internet as a medium is concerned with what the individuals associate to the sources in terms of usefulness based on the characteristics of the Internet. The partial support could be attributed to gender not significantly relating ($p > 0.05$) to the utility (usefulness) of two of the online health information resources (Internet advertising and social media sources). This could be

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as a result of the mismatch of data from homogeneous population with regard to their academic disciplines. Since the data was collected from a sample which was purposively selected based on their academic discipline. This was evidenced when respondents indicated that the health information sought for was for both personal (self-use) and academic (clientele) purposes. Therefore, the variation in research on age and gender and its influence on health seeking behaviour on the Internet which was less conclusive and debatable is confirmed.

## 6.4 Recommendations

The following recommendations were made based on the findings of the study. The study provides important insights into potential avenues for policy and education to improve the health of people. The recommendations are made as suggestions for enhancing increased access to health information and also reduce the risk and barriers associated with health information seeking on the Internet if feasible for the graduate students at KNUST.

### 6.4.1 Enhance Information Retrieval Training Programmes

To overcome the problem of inability to search for appropriate sources of information among students in KNUST, management should be encouraged to apply different training methods, ranging from face-to-face workshops to online study programmes according to training objectives. Regular training schedules can also be organised by the Electronic Resource Department of the university library in collaboration with heads of department of the various post graduate programmes to boost students' confidence and improve their searching or information retrieval skills.

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The findings of the study can be used in academic library services in KNUST, It is recommended that academic librarians use the findings of the study to design instructional, information, and outreach services in collaboration with KNUST Health Services targeted to students, particularly graduate students, on the topic of health information. Information professionals should recommend credible websites to students to aid in accessing of reliable information on the Internet. Professionals should also promote more effective search and evaluation techniques to graduate students.

Health information systems that target health consumers or general public will bridge the gap among medical knowledge, healthcare services, and health consumers. The understanding of information needs and information behaviours of a targeted population is the first step to design a health information system.

### 6.4.2 Education

This study suggests that one of the key issues in students' health information seeking behaviour on the Internet was lack of verification of the health information sought for and using search engine to start their search instead of authentic websites. Therefore, educating students about available health resources on the Internet and even teaching them how to search from the authentic websites would be appropriate. The health service for instance could educate users of Internet health information sources through workshops, hall weeks, GRASAG week and college weeks. This would enhance consumers or students' knowledge about trusted and credible educational non-

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advertising health sources they could consult for health information such as www.ghanahealthservice.org, Medline, HON, WebMD among others.

### 6.4.3 Health Information Providers

Content managers in Ghana (especially health bloggers) must ensure that the information they post on health are properly screened and referenced before publishing on the Internet. The contents could also be tailored towards the health information needs of the country. Therefore, country specific health information must be made available since health needs differs from country to country. An Internet site that provides information for the development of knowledge and skills in personal health and research that users consider credible may be very influential especially to graduate students. However, there is the need for other analyses to understand the extent to which this access to information actually helps users in managing their own health or the health of a loved one.

Academic Librarians in collaborate with CARLIGH must ensure continuous subscription of relevant health related electronic resources to minimise or remove the 'pay wall' to vital, basic and very relevant health related information which hinders people to access those relevant and lifesaving information. These will go a long way to improve access and use of those vital information to enhance the knowledge of people especially students who access the information for research purposes. This could assist in the avoidance of the risk of publishing misleading health information which may be detrimental to the health and output of the end user.

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### 6.4.4 Improvement of Internet Infrastructure

The study revealed that students of KNUST complained of lack of enough bandwidth to allow for satisfactory speed of Internet services to enable them access the Internet health resources faster. The study results also revealed that there was regular interruption in Internet services provision on campus. It is, therefore, recommended that KNUST upgrades the bandwidth to allow for smooth Internet connectivity especially during peak periods. The authorities must also ensure regular maintenance of the network infrastructure to ensure smooth and interrupted connectivity. Network technicians could be employed to manage the infrastructure. The UITS could educate the university populace on the hotlines to call in cases of interruption in the network.

Stronger efforts are needed by Government to ensure that the Internet penetration in the country is improved or increase to increase access and usage nationwide. This includes expanding Internet infrastructure to reach all areas of Ghana. This will go a long way to bridge the technology gap with the outside world.

### 6.4.5 Alternative Power Supply

The research revealed that there was intermittent power interruption on KNUST campus which leads to disconnection in the Internet services. The country is undergoing a severe load-shedding regime characterised by unannounced outages across the country. There are generators on campus to support the power outage which had taken a toll on the entire nation. However, these generators are often not switched on due to insufficient money or lack of funds to fuel the generators. The researcher recommends that solar or renewable energy be adopted in KNUST to take

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care of the deficiency in the energy generation during load shedding periods, since this would ensure sufficient energy to power the Internet infrastructure.

If these recommendations are effected, it is hoped that student patronage of the Internet for health information would be safer, therefore preventing possible cause of death through accessing and using misleading and unreliable information from the Internet. This would go a long way to enhance the life of students which will benefit academia and the nation at large.

## 6.5 Recommendation for Future Research

The sample of this study was selected from students who study health related courses and use the Internet for seeking information to meet their health information needs. However; to generalise and publicise the result to all of the society there is the need to conduct similar studies in other stratum of the Ghanaian society.

Secondly, more Universities could also be investigated to do a comparative study among the various disciplines in the Academic institutions. Further research into the HISB of other disciplines with no health related background and the specific online applications used to manage health issues would be a vital venture. This study adopted a survey approach. It would be an interesting venture to subject this study to a case study approach to compare the findings.

Lastly, research on how the Internet can be used as a tool for disseminating health related information in Ghana would be a useful study. This is as a result of the

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Internet providing an effective avenue for health information promotion which supports development.

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# APPENDIX

## Questionnaire

Dear Respondent,

*The researcher is an MPhil student affiliated to the Department of Information studies, University of Ghana. This questionnaire is to gather data on your knowledge or Thought on the topic: "**Health Information Seeking Behaviour on the Internet in Ghana: A Survey of Graduate Students at KNUST"**. Your thoughtful and truthful responses will be greatly appreciated. Please answer each question to the best of your knowledge. Your name is not required. The sole purpose of the research is for an academic exercise and your responses will be kept strictly confidential. Thank you for taking time to complete this questionnaire.*

**hasay2002@yahoo.com (0244477374)**

**INSTRUCTIONS**

Please **tick [√]** in the appropriate space provided below and supply answers where required

**SECTION A: DEMOGRAPHIC CHARACTERISTICS**

1. Gender: Male**[ ]** Female**[ ]**

2. Age : 22-25**[ ]** 26-29**[ ]** 30-33**[ ]** 34-37**[ ]** 38-41**[ ]** 42 and above**[ ]**

3. Department/Discipline/Course of study?

   Sociology **[ ]** Medicine **[ ]** Pharmacy **[ ]** Allied Health **[ ]**

**SECTION B: USE OF THE INTERNET AND HEALTH INFORMATION SEEKING EXPERIENCE ON THE INTERNET**

4. What is your level of experience with the Internet and use of common Internet activities? Very experienced **[ ]** Somewhat experienced **[ ]** Not experienced **[ ]**

5. How many hours do you spend on the Internet a day?

   Less than 2 hours**[ ]** 2-4 hours**[ ]** 4-6 hours**[ ]** 6-8 hours**[ ]** More than 8 hours **[ ]**

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6. What is/are your main **motive(s)** for using the Internet? **(Please rank with 1, 2, 3, etc with 1 being the first motive)**

   Entertainment **[ ]** Research**[ ]** News**[ ]** Health**[ ]** Socialization**[ ]** E-mail**[ ]**

7. What is your first option for health information source in general? (**Choose ONLY one)**

   Internet [ ] Books/Magazines [ ] Friends/Family [ ] Medical practitioner [ ]

8. Have you in one way or the other source for health information on the Internet in the past six to twelve months? Yes **[ ]** No **[ ]**

9. How much health related information have you tried to get from the Internet for yourself or someone else? A lot **[ ]** Some **[ ]** A little **[ ]** None **[ ]**

10. What is/are your source(s) of health information on the Internet? **(Choose as many as possible)**

    Search Engines and directories (e.g. Google, Yahoo) **[ ]**

    Social media sites (e.g. Facebook, WhatsApp) **[ ]**

    Through advertisements **[ ]**

    E-mails **[ ]**

    Authorised health Web sites (e.g. government, non-profit organization, hospital)**[ ]**

    Text messages from service providers **[ ]**

    Others (Specify)…….

11. What type or kind of medical/health information do you look for on the Internet? (**Choose as many as possible)**

    General information on healthy lifestyle (e.g. Diet, fitness etc.) **[ ]**

    Specific information about a specific disease or treatment (e.g. Ebola, Heart diseases) **[ ]**

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Information about new development in the health/medical field **[ ]**

Information to assist in selecting a specialist (e.g. Doctors, herbalist etc.) **[ ]**

Information about new or alternative treatments **[ ]**

Information on the side effects of medications **[ ]**

12. Frequency of health information searches on the Internet?

Daily **[ ]** 3-4 times a week **[ ]** 3-4 times a month **[ ]** 3-4 times a year **[ ]** Others….

13. How often did you find the information you sought for on the Internet?

Always **[ ]** Most of the time **[ ]** Sometimes **[ ]** Hardly ever or never **[ ]**

14. What do you use to browse when searching for health information?

Phone **[ ]** Personal Computer **[ ]** Tablet **[ ]** Laptop **[ ]** Others (Specify)…….

15. Why do you look for health/medical information? (**Choose as many as possible)**

Because you ran the risk of getting a particular disease **[ ]**

Because you want general information on healthy lifestyle **[ ]**

Because you have been diagnosed and want to know more about your illness **[ ]**

To gain better understanding of the causes, severity and prognosis of a disease **[ ]**

Because I like to search for medical information **[ ]**

To find information on a specific disease, treatment and drugs/medication **[ ]**

16. Why the choice of the Internet and **NOT** other sources? (**Choose as many as possible)**

Because the source is available any time I need it (provides 24/7 accessibility) **[ ]**

Because it is fast and requires minimum efforts to obtain information from it **[ ]**

Because the source does not involve high cost to obtain needed information **[ ]**

Lots of very useful information on preventive medicine is available **[ ]**

It provides information from different sources simultaneously **[ ]**

Confidentiality and anonymity is guaranteed/ Chance to remain anonymous **[ ]**

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17. To what degree has health related information obtained on the Internet improved your personal health? A lot**[ ]** Some**[ ]** Only a little**[ ]** Not at all**[ ]**

18. Who are the beneficiaries of the health information you source on the Internet? Yourself **[ ]** Spouse **[ ]** Children **[ ]** Parents **[ ]** Friends **[ ]** Others (State)……..

19. Do you happen to have any software applications or "apps" that help you track or manage your health? Yes **[ ]** No **[ ]**

## SECTION C: SECURITY, PRIVACY, ACCURACY & VERIFICATION OF HEALTH INFORMATION ON THE INTERNET

20. Do you **trust** the information you source online? Yes **[ ]** No **[ ]**

21. Do you **verify** the information with a medical practitioner? Yes **[ ]** No**[ ]**

22. Do you usually search for health information on the Internet **before** you visit a medical practitioner? Yes **[ ]** No **[ ]**

23. Do you usually search for health information on the Internet **after** seeing a medical practitioner? Yes **[ ]** No **[ ]**

24. Is the health information on the Internet different from the treatment prescribed by the medical practitioner? Yes **[ ]** No **[ ]**

25. If you were to read health information on the Internet, rate the importance of each of the following factors to you.

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| Factor | 1-Very important 2-Somewhat important 3-Not important | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Accuracy | | | |
| Credibility of author | | | |
| Currency of information | | | |
| Comprehensiveness | | | |
| Ease of understanding | | | |
| Readability | | | |
| Personal relevance | | | |
| Confidentiality of personal information | | | |
| Ease of navigation of web site | | | |
| Quality of links | | | |
| Bias | | | |
| Appearance | | | |
| Citation for information | | | |
| Use of multimedia | | | |
| Interactivity | | | |

| 26. On a scale of 1 - 3, rank the following Health information channels and resources you find useful to satisfy your health information need | 1-Always 2-Sometimes 3-Never | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| **Online Sources** | | | |
| Internet advertising sources (e.g., drug brand Web sites, Internet ads) | | | |
| Non-advertising Internet sources (e.g., health-related Web sites such as WebMD) | | | |
| Social media sources (e.g. Facebook, ask.com, blogs, wikis, YouTube) | | | |
| **Offline Sources** | | | |
| Print media sources (e.g., magazine articles, newspaper stories) | | | |
| Direct-to-consumer advertising sources (e.g., newspaper ads, magazine ads, TV and radio commercials) | | | |
| Non-professional interpersonal sources (e.g. friends, relatives) | | | |
| Specialized medical materials (e.g., printed materials from drug companies, professional medical publications, printed materials in doctors' offices) | | | |
| Professional interpersonal sources (e.g. doctors) | | | |
| Other health care providers sources (e.g., pharmacists) | | | |

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## SECTION D. RISK AND CONCERNS ABOUT ONLINE HEALTH INFORMATION

27. Which kind of risk(s) are you exposed to when you source for health information on the Internet?

Access to potential misleading information [ ]

Access to low quality information [ ]

Access to incomplete information because of the demand for payment for the information [ ]

Access to potential unreliable information [ ]

Access to inaccurate information [ ]

Others (Please state)……..……..

28. Do you have any concerns about health information found on the Internet?

Yes **[ ]** No **[ ]**

29. If **Yes**, Please write down your concern(s)……...

30. How do you overcome your concerns or how you think it should be resolved……

31. Which of the following are constraints to effective health information seeking on the Internet?

Not knowing appropriate sources **[ ]**

Limited knowledge of understanding health information **[ ]**

Inadequate finance/high cost of online resources **[ ]**

Erratic power supply **[ ]**

Perceived lack of quality service **[ ]**

Denial of access to information due to inability to pay for access to resource(s) **[ ]**

Others (please specify)…….

32. What problem(s) do you face using the Internet to search for health information? (Please specify)……..……..

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33. Any additional comments or suggestions or recommendation?

……

……