ADDIS ABABA UNIVERSITY
SCHOOL OF PUBLIC HEALTH
AND
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ONLINE INFORMATION SEEKING BEHAVIOR OF HEALTH PROFESSIONALS: A CROSS SECTIONAL STUDY OF PRIVATE AND PUBLIC HOSPITALS IN ADDIS ABABA

BY
DEGALE DESTA

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Declaration

I declare that the thesis is my original work and has not been presented for a degree in any other university.

Degale Desta

Signature: _____

Date: _____

This thesis has been submitted for examination with my approval as university advisor.

Rahel Bekele (Ph.D.)

Signature: _____

Ababi Zergaw (Ph.D.)

Signature: _____

Addis Ababa University

This is to certify that the thesis prepared by Degale Desta, entitled: Online Information Seeking Behavior of Health professionals: the Case of Private and Public Hospitals in Addis Ababa and submitted in Partial Fulfillment of the Requirements for the Degree of Masters of Science (in Health Informatics) compiles with the regulations of the University and meets the accepted standards with respect to originality and quality

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Advisor _____ Signature _____ Date _____

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ACRONYMS AND ABBREVIATIONS

AACAHB:	Addis Ababa City Administration of Health Bureau
AENHISFR:	Assessment of the Ethiopian Health Information Systems Final Report
AFGTRH:	Armed Force General Teaching and Referral Hospitals
AOHI:	Access to online health information
CDC:	Communicable Disease Control
CSA:	Central Statistical Agency
E-health:	Electronic Health
E-mail:	Electronic Mail
EFY:	Ethiopian Fiscal Year
ETC:	Ethiopian Telecommunication Corporation
FMOH:	Federal Ministry of Health
FTP:	File Transfer Protocol
HIV/AIDS:	Human Immunodeficiency-Virus/ Acquire Immunodeficiency Syndrome
ICT:	Information and communication
IP:	Internet Protocol
ISPs:	Internet Service Providers
JAMA:	Journal of American Medical Association
NGO:	Non-Government Organization
SPSS:	Statistical Package for Social Science
URL:	Uniform Resource Locator
WHO:	World Health Organization
WWW:	World Wide Web

ABSTRACT

Background: Online information has become a ubiquitous part of health information lives, so that most health professionals have access to and are comfortable with using it to look for online healthcare provision and decision making.

Objective: To identify the behavior of online information use of health professionals for provision of health care

Methods: A cross-sectional study was conducted in seven selected hospitals in Addis Ababa, Ethiopia using both quantitative and qualitative methods by using self-administered survey questionnaire. Data were analyzed using correlation and multiple regression statistical procedures.

Results: The results of this study has shown that ease of information seeking, feeling empowered, self-health management and support from the online community has been powerful motivators. Predictive association in healthcare provision using multiple linear regression coefficients, when access to online health information increases by 0.039, 0.028 and 0.025 units for 1 unit increase in the scales of empowerment, online social networking and cognitive involvement with related health information respectively, and decreases by 0.007 units for 1 unit increases in the scale of age. Likewise, Predictive association in healthcare provision using multiple linear regression coefficients retained positively correlated with access to online health information and ease of information seeking, getting preventive healthcare tests, self-healthcare management & privacy and positive outcomes related to networking and learning with increasing rate of (0.182, 0.346, 0.021 and 0.495) respectively.

Conclusion: Health information from online sources is a significant component of health professionals' self-healthcare provision plan and initiates collaboration of professionals work in overall health care dissemination and retrieval information. However, health professionals expressed strong desire to use internet sources, the study has identified a number of barriers to use internet.

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

The need for information is one of the "cognitive needs of mankind. Information needs causes information seeking behavior and these concepts balance one another." Information seeking behavior is expressed in various forms, from reading printed material to research and experimentation to internet. Currently, scholars, students, and health professionals actively seek up-to-date information from various sources available in libraries, e.g., encyclopedias, journals and online information or internet (Wilson, 1999).

In line with this, the online information has become an increasingly important source of health information in recent years. There are supply and demand forces driving this move. On the one hand, the online information or internet has become a ubiquitous[1] part of our information lives. So that most healthcare providers have access to and are comfortable with using it. On the other hand, private and government organizations are using the online to make available health information to all health care providers in general, while healthcare practitioners and healthcare professionals are encouraging in the participation of healthcare provision. Given its growing importance, there is a need to develop understanding of online health information seeking as a mode of information behavior with its own unique characteristics (Reddy and Dourish, 2002).

Accordingly, most popular online information sites in Pew Internet and American Life Project (2013)[2] stated that some of the most applicable online information for health care service provision are electronic mail (e-mail), discussion groups, news, remote login, files transfer, World Wide Web (www), video conferencing, internet broad casts, etc. Gabarron et al (2012) stated that the most popular online applications considered as social networking sites are Facebook, Twitter, Youtube, Skype, Linked in, MySpace, Google Plus+, etc. that allow "users to post, read messages and share videos and other information as well as considered the main sources of information specially for promotion and prevention of public health problems."

[1] Accessible and covers every institution if connected with hospitals

[2] http://www.pewinternet.org/PPF/c/5/topics.asp

Likewise, study was conducted by Reddy and Dourish (2002) online information use to gather information, share stories, and discuss concerns. With consequence, this study sets out to clarify the different ways of online information seeking behavior as well as how health professionals use online applications to share their experience without limiting geographical distance in health care service provision.

Acordingly, Gabarron et al (2012) stated that online information resources are fast permeable into the common consciousness of professionals in order to provide community health care provision. They further state that it is now common to find that when health professionals (including end-users with no formal search training) decide to find information from the internet.

In line with above, the "Public Health" is a contemporary application of a broad range of evidence-based online information to improve the health of individuals and populations through the involvement and gratification sought of health professionals. Nevertheless, on the whole, online health information has made knowledge accessible to those who actively seek it in better formats with greater ease. By making room for discussion and support, online spaces help healthcare professionals feel empowered to deal with their own communication, all with an added aspect of privacy for those who want it (Marton, 2011). Without geographic constraints, health care information and research diffuse faster, and can be designed to needs thanks to interactive web sources.

1.2. Statement of the problem

Research studied by Brand-Gruwel et al (2009) suggests that current users gravitate toward online resources because new users have characteristics that make them unique like higher education and easy access to computers. In addition, they have had varied online experiences like online shopping and e-mail, and they understand internet as a functional, inexpensive, and an easy-to-use that works well across time and space in collaborative situation.

Likewise, online information seeking is appealing not only because of the characteristics of the users, but also due to the advantages the medium itself has to offer (Yun and Park, 2010). Online resources allow for quick access to easily understandable information in diverse areas, with multiple viewpoints, and with alternative options. Moreover, Brand-Gruwel (2009)

suggested that information on the "internet is available 24 hours, 7 days to answer without judgment questions that may be private or public in nature in healthcare provision". This thesis is measure health professionals' satisfaction. For measure that the researcher can use gratification sought that can be identified by comparing the satisfaction of health professionals in the available online information sources. With the beginning of online information, the field of health communication has reached a new era of interactivity and involvement. Brand-Gruwel et al (2009) define interactive health communication as "the interaction of an individual, patient, healthcare provider with or through an online information sources to access health information," and one of the most common indicators of interactive health communication is disseminating and retrieving online information through health professionals.

Accordingly, greater use of information resources is associated with better overall health status. The motivation to seek health information evolves from prior health information seeking experiences, perceptions about sources of the information, and online sources of health information (Marton, 2011). In addition, health professionals who actively seek information about a particular health condition with online information flow from multiple sources may be more stimulated about healthcare services than others who obtain health information only through their interaction of traditional method such as books, manual reports, etc. Traditional information is shared as static and duplicated entities while online information provides dynamic interaction with in healthcare providers (Brand-Gruwel et al, 2009). However, the health care service provision of hospital settings in Ethiopia in general and study area in particular, which is mainly paper based as means of delivery. It is so inactive and no interactivity among the health professionals. Additionally, according to assessment of the Ethiopian national health information system final report, 2007 that the skill gap in online information is considered as one of the factors for interactivity that affect the quality of health care provision. This study identifies that the access of online information associated with health information in order to educate and promote community and it can bring the missed interactivity using different available online sources

In addition to this, many of health facilities get communication of offline systems for information flow in healthcare provision due to poor internet availability through

monopolized internet service provider (ISP[3]) and their lack of searching skills in available online sources like HINARI, MEDLINE, PUBMED, etc. is/are another associated factor in healthcare provision. So that this study examines the credible online health website sources with search engine in health professionals particularly in hospital setting of Ethiopia (Baylis, 2005; Etsub, 2009 and Sirak, 2012).

The latest work conducted by Etsub's (2009) culture of physicians' online use in "availability of online medical information to improve clinical care of patients" is one of the ways to improve the clinical outcomes. Later on (in this study), the scope expanded online information seeking study to other health professionals focusing on association of internet with access to use online health information and with identifying the most frequently accessed health web sites. Accordingly, the study also examines the gratification sought of health professionals for accessible healthcare service provision. Besides of this, Etsub's (2009) study invited further research on this topic to address internet usage among different health professionals. Finally, in this study, internet self-efficacy is examined in order to recognize confidence of internet use in the health professionals. This study also examines the relationship between internet use of the health professionals and behavior modification[4] in order to provide healthcare.

[3] Internet Service Providers
[4] getting health-related information and evaluating online application into everyday healthcare provision

1.3. Objective of the Study

The general objective of the study is to identify the behavior of online information of health professionals for provision of health care in hospitals of Addis Ababa, Ethiopia

To realize the abovementioned general objective, the following specific objectives are drawn to conduct this research.

- To identify perceived gratifications sought of health professionals when accessing online health information
- To show relationship between access to online health information and health-related behaviour modifications among health professionals
- To identify the most frequently accessed websites by health professionals
- To examine the relationship between access to online health information and perceived credibility of online sources

1.4. Scope of the Study

The study considered the association of accessing online information with information seeking behavior of the health professionals in terms of gratification sought, internet self-efficacy, perceived credible online sources and behavioral modification. This study focused in Addis Ababa private and public Hospitals rather than other health institutions such as NGO[5] hospitals, health centers and health posts. Consequently, the study identified sources in online health information, usage pattern of online and online source association in health care provisions as well as usefulness and sensitivities of the internet use to increase their health care provisions. The study populations were health professionals such as Health Officers, Public health officers, Nurses, Midwife nurses and Pharmacist/pharmacy technicians whose qualification is Diploma and above as well as who work in public and private hospitals for provision and promotion of health care services by using online and its applications in Addis Ababa, Ethiopia. In addition to this, inclusion and exclusion criteria briefly discuss in later chapter three about scope in this study.

[5] Non-Government Organization

1.5. Organization of the Study

This thesis organized into five chapters: the first chapter introduces the concept of online information and gives a background of some historical online information seeking behavior of health professionals through discussion of some efforts to associate effective online information in health care provision. The second chapter explains the online information units in order to set a framework for the online information seeking behavior of health professionals. The searching behavior in online concepts, sources and its associations through available internet access based on relevant literature reviews are described in detail. The third chapter describes the methodology of the study including the population, sample, sampling framework, data collection instruments and a general description of data collection process and procedures. The forth chapter addresses the findings and discussions with relation of online information application and healthcare provision by health professionals. Finally, the fifth chapter offers summary and concluding remarks about the research that was done and the online information that were described.

1.6. Rationale of the Study

The purpose of this study is to explore the availabilities and use of online health information among health professionals with identifying of gratifications sought; internet self- efficacy, cognitive and behavioral involvement, and outcome expectancy. In addition, the study examined the relationship between behavior modifications and access to online health information, an area that has been understudied. Accordingly, past research reveals that it is important to understand what health professionals do with the information in order to access and process online sources and what impact it has on their health behaviors (Hu and Sundar, 2010). The study also looked at choice of online health information sources of health professionals and their credibility and reliability. Within an online environment where health information is freely and abundantly available, the study is relevant in light of the absence of set guidelines of online health information content and its growing popularity among online users in the study area. On a broader level, the study examines what the implications of access and practice of online health information are on the overall healthcare provisions in hospital settings (Bandura, 1986; cited in Marton, 2011 and Bates et al, 2007).

CHAPTER TWO

LITERATURE REVIEW

2.2. Definition and Concepts of Online Information Seeking Behavior

2.2.1. Online information

Marton and Choo (2011) define online information as "global network of networks, which can share information through text, video, sound, graphics, image, etc." They expresses online information as internet or global interconnections in which users at any one computer or mobile device can get information through the help/ facilities of internet service providers (ISPs[6]).

Generally, the online has become a worldwide accessed information when healthcare professionals aware of looking for information wherever in the world. So that most healthcare professionals can access to and are comfortable with using it to look for health care service provision in order to prevent and control public health problems. For that reason, private and public health organizations encouraged to use the online from available URL[7] health information and initiated the participation of health professionals in health care promotions and surveillance meetings. Given its growing importance, there is a need to develop their understanding of online or internet application as a method for information seeking behavior (Bates et al, 2007).

2.2.2. The Online Information Seeking

Beacom & Newman (2010) stated that one of the most common information-seeking processes that computer users engage in the use of internet search engine for healthcare provision. This study was declared that: "the availability of information on the World Wide Web (WWW) has established search engines as a major tool for information retrieval and disseminates documents as popular online sources through which users' seek information." Although this observation might specifically be about search engines, it lends itself well for application to the broader spectrum of other online information sources. Interaction with in

[6] ISPs which facilitates the availability of internet example ETC in Ethiopia
[7] URL: uniform resource locator

online information is mainly through search engines; social networking sites, blogs, and other recent phenomena have explosively come to the fore and cover all over the world.

2.2.3. Online Information Seeking Behavior:

According to Bates et al, (2007) explained as a process which requires information searcher such as health professionals' cognitive capacities, skills in relation to work load or tasks domain to solve faced challenges. Information is initiated to identify a message for decision making. This can be described as an individual's way and manner of gathering and sourcing for information and personal use, knowledge updating and development. Also it referred to as the way healthcare professionals "looking for" and uses information. Bates et al (2007) observed that often individual's information seeking behavior involves active or purposeful information as a result of the need to solve faced problems, for instances giving diagnosis, sharing health care information, remote consulting, video conferencing, need assistances from online, etc. This limits their capabilities to satisfy their needs.

2.3. Sources for Online Information Seeking

By definition, an online information sources such as search engines, social online networks, hospital websites, insurance and pharmaceuticals website, etc. are the sources by which information seekers find and access database (Beacom & Newman, 2010). These sources are the house of information in numerously and varied. To many newcomers, the online information is simply a large search engine. Web search engines are essential tools in the mission to locate online information, but in spite of their popularity, search engines are just one in a group of sources available to healthcare provisions on the online information. Understanding online behavior involves more than simply understanding search-engine related behavior.

In line with this, search engines and other websites, one can use a number of various resources, such as full-text articles, newsgroups, directories, specialized search services, FTP files[8], etc., when using the internet to get health care information (Beldad and Steehouder, 2011). Their study stated that the online information as a whole can be seen as an information

[8] File Transfer Protocol: A software protocol for exchanging information between computers over the internet.

sources that can be used to identify information sources (i.e. compared to printed channels), it actually consists of numerous information channels, from portals to directories, databases, websites and discussion groups, put it:

as valuable and rich as the online information is, presently, there are few ways to search and locate information on the online: one can use (i) the existing search engines to reach a select set of ranked sites, (ii) meta search engines that in turn employ multiple search engines, and aggregate and rank search results, (iii) question-answering systems (e.g. AskJeeves - www.ask.com) that allow users to pose questions, and return their answers; or, one can (iv) follow links and browse Electronic Mail subscription (E-mail).

Other sources of online information include bibliographic databases like Hinari, Medline, etc., full-text journal services, and document delivery and disseminate services, current awareness services and intranets. The wide range of services detailed above illustrates that combined impact of the development of the internet in online (AlGhamdi & Moussa, 2012).

2.4. Theoretical and Empirical Framework and Constructs

2.4.1. Uses and Gratifications

Uses and gratification on the premise that health professionals use online to fulfill satisfactions, needs, and interests (Manafo, 2012) and these needs have psychosocial origins. Research in this line of thought revolves mostly around motivations of internet use. Likewise, Luo et al. (2011) summarized the beliefs of uses and gratifications as follows: "the social and psychological origins of, needs which generate expectations of, the sources which lead to, differential exposure (or engaging in other activities), resulting in need gratification and other consequences."

The assumptions of uses and gratifications by Philip et al (2009) studied that the "gratifications sought are the various motivations based on expectations for both media and non-media use behaviors." Gratifications obtained are the "perceived personal outcomes" of these behaviors. Communication by health professionals is goal-oriented and purposive; professionals assess their needs (relaxation, involvements, encouragement, relationship, and practice) and subsequently use internet that satisfies these expectations. Internet is not the only influence in healthcare professionals' lives, and their expectations stem from their own

qualities, the social context and interactions. Healthcare professionals can make subjective decisions and interpretations, thus using this decision making process to select internet and messages and these specific online source selections have specific outcomes on the health professionals and the surrounding communities.

In addition, study conducted by Luo et al. (2011) preliminarily suggested five ways that societal factors can affect individual needs. Health professionals turn to online when social situations create awareness of problems that demand attention, information about which is sought in different sources, deprive real life opportunities which online can satisfy, transmit specific value that can be obtained from online and provide familiarity which must be met to fulfill aspirations of healthcare providers. Particular interest to this research project is when the social situation creates awareness and users turn to internet for more information. Research on users accessing health information substantiates this suggestion by revealing that health professionals can access information according to healthcare provision status (Philip et al 2009)

Crucial to theoretical assumptions of uses and gratifications is the understanding of what motivates health professionals' to use internet. In other words, the satisfaction scale from the usage of internet sources by health professionals (Meyrowitz, 2002, cited in PhiliP et al, 2009). Their study view in gratifications sought provided that a comprehensive idea of what these motivations are: change (escape from everyday problems), personal relationships (substitute for friendship), personal identity (reinforcement of personal values, morals), and surveillance. Alternatively, outcomes of online use are perceived gratifications obtained. Perceived outcomes are important in the sense that future online use and evaluation of online use depends upon the perceived fulfillment of gratifications sought.

Although online gratification sought state that given the distinctness of internet, particularly its interactive and user-directed nature, uses and gratifications as a user-level approach is well-suited to the study of content on the internet (PhiliP et al, 2009). In this thesis on uses and gratifications for online information, suggests that the emergence of new online technologies has "revived it uses and gratifications from inexpression." The author considers uses and gratifications as an excellent perspective to study new online from, particularly given at least three characteristics of data that online possess not commonly associated with

traditional media. In other words, interactivity (participants having control over communication processes), and asynchronies (messages overcome on time) of internet as online change the perspective from which uses and gratifications of online are studied. Additionally, when it comes to internet communication, terms like active and audience have to change, and needs are to be looked at from a different point of view (Marton and Cho, 2011).

With regard to this, one of the essential components of uses and gratifications is health professional's activity, and communication motives are central components of online healthcare provisions (Marton and Cho, 2011). Motives are general personalities that influence healthcare professionals' actions which are taken to fulfill a specific need or want closely examined predictors of internet use with regard to uses and gratifications, and found that motives for internet use consisted of, interpersonal utility, pass time, information seeking, convenience and entertainment. Additionally, their findings were consistent with the informative and collaborative capabilities of internet. Internet is often used as a functional alternative for users for whom other channels are not as rewarding or satisfying, as implied by the relationship between internet motives and healthcare provision factors (Ibid).

At the end of the analyses, the researcher (Marton, 2011) identified three uses and gratifications profiles: content gratifications, process gratifications and social gratifications. Content gratifications were characterized by terms like education, information, knowledge, learning and research. Process gratifications were characterized by terms like resources, search engines, and web sites. Finally, social gratifications were characterized by variables like chatting, friends, interaction/collaboration and professionals. Looking at the content gratifications profile, it seems like most of the "internet content serves goals."

Of the above mentioned research behaviors, those that are particularly relevant for the proposed research topic are the motivations for online information seeking, in this case, seeking health information online, what gratifications are sought specifically by use of internet (Goldman, 2009).

2.4.2. Internet Self-efficacy

According to Lagan et al (2011) perceived self-efficacy defines as "beliefs in one's capabilities to organize and execute the courses of actions required to manage prospective situations." How healthcare professionals think, feel, act or motivate themselves to act is influenced by self-efficacy.

Scholars have shown significant links to the role of self-efficacy in comprehension and application of uses and gratifications (Leung, 2008). His study suggested that gratifications sought can be linked to self-efficacy in that healthcare professionals will turn to particular online sources with needs if they believe that their needs can be fulfilled through use of that online. For the purpose of this study, internet self-efficacy was closely considered. According to Warren et al (2010), self-efficacy should be tailored to the domain of interest for maximum prediction. As far as internet is concerned, self-efficacy has been particularly studied to see how it affects use of the medium, and vice versa.

A survey was undertaken by Warren et al (2010) to develop a reliable operational measure of internet self-efficacy. The authors developed and administered an "eight item self-efficacy scale to American-African" class based identities that questioned participants how confident they manipulated they were in understanding terms related to internet hardware and software, describing terms related to the internet, troubleshooting problems on the internet, explaining why a task will not run on the internet, using the internet to gather data, learning advanced skills using the internet and turning to online support groups for help. Results revealed that internet self-efficacy was positively correlated to internet usage, previous experience, and outcome expectancies, and negatively correlated to internet stress.

The factor analysis revealed that use of internet technology by health professionals is more a function of self-efficacy than traditional technology. In yet another study conducted by Zhu et al (2011) were examined the role of self-efficacy and supplemental role in the impact of internet usage on credibility, as well use and utility of newspapers. The results revealed that increased internet use leads to an increase in self-efficacy, which then leads to positive effects about the online credibility. This finding was significant only in internet searches for information and not for entertainment.

2.4.3. Involvement

Involvement emerges as an important variable while examining how different health professionals interpret messages depending upon how involved they are with the topic or issue, which in turn will determine how much information they process (Santosa et al, 2005). While there is a certain uncertainty around what involvement is and how it is to be measured, Santosa et al in their study agreed that involvement is a personality attribute and an internal state consisting of cognitive, affective and behavioral components. Therefore, conceptually, "involvement is motivation that allows healthcare professionals to pay attention to online content problem occurs." Operationally, involvement is a component of the medium or message issue.

Cho and Lee (2008) suggested that coordination expectations from health professionals for healthcare provision are important enough to develop measures that examine health professional attitudes. The authors recommend that the psychological effects of self-health management may be considered in terms of personal control, and that information can be intellectualized as a form of cognitive control. Health professionals may want varying degrees of information, the authors continue, and direction from their co-worker/ health care professionals. Likewise health professionals more involved with healthcare decisions to show a higher degree of desire for cognitive involvement, whereas behavioral involvement indicates the health-professionals desire toward engaging in health care of provision (Goldman, 2009 and Renee, 2009).

As far as internet and involvement are concerned, Cho and Lee (2008) argues that online health care professionals with higher amounts of information and behavioral involvement, and an internal locus of control should have higher positive perceptions of and experiences with the internet or online information. The variety of health information on the internet might be more attractive to those who are actively involved in their own health and healthcare provider. Cognitive involvement, behavioral involvement, internal locus of control, and web experience as variables that are related to internet self-efficacy, building the case that health care professionals actively involved with their own health may be more confident in their abilities to navigate the internet for health information because they feel that can have an effect on their health outcomes (Kreijns et al, 2004).

Jochems, W. (2004) frames an involved user as a health conscious provider engaging in activities that lead to better health, and results of his study found that health professionals who are motivated toward health issues are more likely to search for health information online. Additionally, structural models are often viewed as a set of variables with powerful predictive power and thus the study undertaken by Sirak (2012) holds special relevance in this discussion. Although a model of interactive advertising, the authors provide valuable insight into the world of collaborative web surfing and user motivations in general a theoretical framework revealed that users with high information motivations are more likely to engage in healthcare provision message collaboration (user collaboration with messages; ability to change, modify or seek content), while those with low information motivations are more interested in a more social professional-professional collaboration (Goldman, 2009).

2.4.4. Outcome Expectancy

An outcome is the consequence of performance, and outcome expectancy is the expectations that healthcare professionals' believe will be satisfied upon undertaking online information (Marsico and Levialdi, 2004). Expected outcomes determine behavior to a certain extent. Where self-efficacy is the confidence of healthcare professionals in their own abilities to achieve a particular task, outcome expectancy is the expectation of the consequence of having achieved a task. Perceived benefit from undertaking an action or behavior is positive outcome expectancy, while negative outcome expectancy is cost or difficulty as a result of specific behaviors and becomes a psychological warning. Self-efficacy and outcome expectancy are significantly related (Marsico and Levialdi, 2004), in that healthcare professionals may believe that they have the capability of undertaking about transmission of online information, but may not do for fear of negative consequences, and vice versa.

2.4.5. Credibility and Reliability of Online Health Information

Owing to its very nature, the quality and sources of health information on the online information is a major area of concern among health professionals' communications and the health care community at large. Because, online information is the fastest growing web sources of information and the current provision of health information is the internet (Goldman, 2009). There is apparently endless supply of information about health and just about anything else you can imagine on the online information along with opportunities to

interact with health professionals all over the world. Imagine being diagnosed with a rare health condition, and being able to connect with other health care professionals who share his/her opinion, experiences on treatment and prevention option (Mengistu et al, 2007and Etsub, 2009)

In addition, the growth in online information sources and up-date URL sources has created a communications revolution that puts immediate and equal access to previously unavailable or difficult-to-find information at health professionals' fingertips (Marton, 2011). Unfortunately, the quality of that information can be described as the good, the bad and the ugly. This important consideration when those healthcare professionals rely on this information to make important decisions about their health and healthcare (Hauber, et al, 2002). However, the online information particularly the internet has virtually no controls over who is posting information or whether the information is correct, or even safe (Hu and Sundar, 2010).

In line with this, Ayers and Kronenfeld (2007) notes that concern for the quality, credibility or reliability of information found on the online information is painfully missing. "Misinformation could be a matter of life and death," and thus low quality information is a serious threat that health professionals may or may not realize. Also Hu and Sundar, (2010) identified that information on the internet can be deficient: due to lack of quality control in production, if neither the author nor target providers may be indicated, because of lack of contextual or technical background, or specificity of availability of treatment or prevention options. However; classification and filtering systems are being developed, health professionals are still a gap from being practically used (Ibid). Moreover, this study observed that those who go often to the online for health information and have higher expectations in terms of reliability, relevance and quality of health information, tend to observe that the online information as playing an important role in healthcare fields of their provision as well (Ibid).

The Pew Internet and American Life Project (2013) showed that healthcare professionals believed in online health information; online should support, not replace the doctor-patient relationship. But the system can assist them to exchange information about treatment and

prevention option, experiences; incapacitating condition care facilities, dealing with complications; current research issues; and others.

Journal of American Medical Association (JAMA, 2013)[9] suggest that while online information is a powerful resource that can be an important tool in self-health management, the accuracy of information on current physical or mental state of patients, or vice versa. In a survey of 324 adults with HIV/AIDS, patients with a low income or low education level were more vulnerable to misinformation. Since HIV/AIDS is more prominent among disadvantaged groups, this can have considerable effects on patients' coping strategies the JAMA (2013) website. On a positive note, healthcare professionals tend to have a high level of trust, to educate and promote healthcare systems to patients using online, and discuss this information with co-workers frequently.

To this discussion of overall quality assessment, Canadian researcher Marton (2011) adds the attribute of relevance as revealed by a web-survey component of a multi-method study of 265 Canadian women. Aged 25-45 years, single and well educated, participants answered Likert-scale type questions as well as provided open-ended comments about the relevance (measured in terms of comprehensiveness, timeliness and usefulness) and reliability (measured in terms of authoritativeness, credibility and dependability) of health information websites as compared to other information sources (health-care practitioners, electronic media, print media and so on). The results of the survey revealed that overall, health information websites were "generally perceived as offering highly relevant and fairly reliable health information when compared to other sources of health information." More importantly, the study revealed that not only reliability but also relevance was an important attribute of quality assessment. A health care provider may or may not find health information relevant according to health status, age, geographical location, gender, sexual orientation and cultural and religious beliefs about health and illness. Information can be reliable but irrelevant without this added aspect (Madle et al, 2009).

[9] http://jama.jamanetwork.com/article.aspx?articleid=1685855

2.5. Internet and Health Care

The Pew Internet and American Life Project (2013) has been conducting surveys on health information seeking behaviors and indicators since 2000, and their results suggest that online health information seeking is an extremely popular activity. Their survey results from 2003-2007 have shown that "between 75% and 80% of Internet users have looked at health information online, and these numbers are growing." Findings from research study by Anker et al (2011) reveals that a trend engaged and motivated healthcare provision. The results also suggest that users having high speed broadband connections, a disability and/or disease are significantly more likely to look at online health information. However, in addition to convenience, what keep bringing health care provision back to online information resources are the positive experiences. Of the 2054 adults who responded in the study, 31% said that online health information had helped them or someone they knew, as opposed to 3% who said that they or someone they knew had been harmed by it (Anker et al, 2011).

Baldwin et al (2008) suggested that the number of internet users accessing health and wellness information online dynamically increases, there will also be an increase in regulated provider health information services, an increase in online support groups, emergence of health care provider information services, and more health professionals asking to access electronic medical records with interactive manners.

The online health information is definitely rising and the impact is worldwide. A qualitative study in Switzerland which looked at access to internet and its use for health information reveals that increasingly, more and more patients were using online health information resources (Caiata-Zufferey et al, 2010). Above and beyond health professional-doctor communication, physician-physician communication and patient support communication, the interactivity and information offered on the Internet hold the highest implication for the field of health communication (Robinson, 2009). Users bring in a variety of environmental and individual attributes while actively seeking online health and wellness information. Robinson concluded that more and more health communication campaigns are using interactive online tools to appeal to high-involvement users.

According to Wilson (1999) recognize that in addition to technical solutions for medical professionals or administrative tools for managers, a rapidly growing area of online health information are tools used by users to manage their own health. The author pinpoints three areas where health professionals are directly involved with online health dealing with health services administration (e.g. appointments), facilitating homecare of patients through remote monitoring, avenues to access health-related information and advice. This last area is of particular relevance to the study, and effectively identifies the emergence of an empowered consumer.

Bremner et al (2006) conducted a meta-analysis of 12 articles to appraise user experiences using ICT with relation to health and wellness. The articles were retrieved using Medline and Cochrane databases as well as manual searches. The analysis revealed three broad themes: support and help, education and information, and telecommunication instead of onsite visits (computerized electronic applications-mostly that users could access assuring accessibility to healthcare independent of time and space). One study of particular interest was conducted by Gustafsson et al (2003) where use of online information technology was examined among young adults, particularly their experiences, attitudes and health beliefs. Twenty-five thematic interviews were conducted with young adults (18-24) using grounded theory with a constructivist approach. The findings suggest that use of ICT among young adults consequently results in a feeling of efficiency and independence. On the other hand, they have misgivings and perceive some dangers. Most of the time, IT use is only for satisfying the current need and has no implications for the future (Sirak, 2012).

An analysis conducted by Hardey (2001) reveals that healthcare professionals are not only users of online health information, but also the producers of health-related content on the internet. The project looked at two studies: first a qualitative study of 10 households to find health information, and second, a survey administered to home page authors of websites where they posted accounts of ill-health along with an examination of the web pages. As far as consumption of information is concerned, users accessed health information online because of ease of access, confidentiality, cost-effectiveness, user-centeredness, and diversity of information. On personal web-sites, support groups and chat rooms, healthcare professionals

of health information in turn became producers of health-related content, where relevant resources interspersed with personal narratives.

In a survey of 851 healthcare professionals examining the use of Internet for health information in a primary care setting in South Wales, UK, authors Dolan et al (2004) found that online health information was the second most preferred source of information in health care provision. The survey administered over a 3 month period in two general practice primary care facilities in low and high income areas revealed that over half the users in each setting (51%) had access to Internet and among these healthcare professionals, half of them had used it to access online health information. Under a quarter of the health care professionals had used the information they obtained online in face-to-face discussions with their co-workers. While the researcher found no significant difference in use due to gender differences, age did have a role to play. Health professionals aged 24-54 were twice as likely to access the Internet for health information. Consistent with the literature, only 7% of those surveyed said that they did not trust the Internet for health information.

Delic et al (2006) argue that the primary motivation behind use of Internet for health information is to supplement insufficient information or unanswered questions after face-to-face visits with their healthcare professionals, as suggested through findings of a survey of 949 users over 2003 and 2004. The study, conducted in Croatia, suggests that 85% of the respondents went online to seek health information after a diagnosis, and half of those discussed this information with their doctors in a subsequent visit. Furthermore, the survey revealed that the majority of the respondents were women, who were also more likely to undertake information searches for friends and family.

Morahan-Martin (2004) conducted a comprehensive review to determine how online health professionals find, use and evaluate online health information by examining data measuring differences in search and use among users from United States, France, Germany and Japan as well as observational data from various countries. Findings suggest that online health professionals seek specific health information about a disease or condition that they or someone they know has been diagnosed with. Users typically use general search engines, search with short phrases (often misspelled) and rarely search beyond the first page of the search. They do not follow the indicators of credibility and reliability of websites, though they

browse clear of websites with obvious associations. Data from the cross-cultural study suggests that most health professionals who went online to find information found what they needed and were satisfied with it (Morahan-Martin, 2004).

While they rarely check indicators of website credibility, they are aware of the limitations of online information. Users also report discussing online information with their primary healthcare provision. Particularly within the United States, two groups of health care professionals are known to be more alert and attentive: parents of children under 18 who live at home and those who are chronically ill. Based on the findings, the author recommends that health care professionals should recommend websites, promote effective search and evaluative techniques and get involved in developing uniform standards (Ibid).

Current health status as a factor that appears to affect access and use of information is also visible in the study conducted by Santosa et al (2005), examine consumer demand for health information on the internet by surveying 12,878 members aged 21-64 years of age. This conducted study tested two hypotheses using the theoretical framework of human capital model for health: health professionals with health concerns who obtain greater benefits in general from health information are more likely to turn to the Internet for health information and health professionals facing higher costs in accessing health information from traditional settings are more likely to use the Internet for health information.

Another study that repeats current health status as a theme is the multi-variate survey analysis undertaken by AlGhamdi and Moussa (2012). The study was investigated how sick and healthy healthcare professionals differ in use of Internet and e-mail for health purposes. The study revealed that sick and disabled respondents were not only more likely to access health information online, but also do it more frequently. This led the authors to ask interesting questions about reliability of sources and credibility of the information.

Similarly, Beacom & Newman (2010) suggest that recent literature in the field of health and wellness highlights the importance of information and information seeking as one possible response to health care provision uncertainty. The authors define information as “stimuli from a person’s environment that contribute to his or her knowledge or beliefs,” and information seeking as “communicative and cognitive activities such as looking for, avoiding, providing,

appraising and interpreting those environmental stimuli"). Beacom & Newman (2010) explained that health information is, "any information related to the practice of healthcare. This includes knowledge of human anatomy, physiology and pathology, and the maintenance of good health and treatment of disease, as well as information related to patient care, such as patient records and epidemiological databases." This broad working definition of health information allows the inclusion of several aspects of health and wellness that health professionals might be seeking.

However, using data from the National cancer Institute's 2003 Health Information National Trends Survey, Mayer et al. (2006) examined use of online health information among cancer survivors. Around 65% of the 418 survivors looked for information online, and results showed that age (<65) having a regular health care professionals were significant predictors of Internet use. Moreover, despite the fact that most survivors preferred getting information from their health care providers, they most frequently accessed the Internet when they needed it. Therefore patients highly in need of health information from health care provider with in promotion and teaching the online sources to them

Al-Shammary, et al (2007) surveyed patients to study how many patients accessed online information, and how prevalent information seeking was based on age, gender, health status and so on, and why they use the Internet as opposed to other media. 208 patients surveyed about their online health information practices revealed interesting results. Of the 208 patients, 44.7% had used the Internet for health information, of which a sizeable 89.2% used the internet for information before consultation with their health care professionals and with whom they discussed this information. Patients with both acute and chronic illnesses accessed online health information, although those with acute conditions were 50% more likely to use the Internet than the other group. There was marginally more women health care professionals (40.6%) than men (38.8%), and patients aged 30-40 years were the most active health care professionals. Self-diagnosis was the most common reason for using the Internet over other media.

2.6. Ethiopian ICT Policy for Online Information Bandwidth Facilities

ICT policies influence Ethiopian online information provision especially in internet availabilities. Government policies in online or internet facilities have been highly influential in online information dissemination. Within Ethiopia, governments control most of Online information infrastructures and defend different policies (Checchi et al., 2002, Dutta, 2001: Cited in Mengistu, et al., 2007) that

influence acquisition and private use of these infrastructures. With policies encouraging ICT ownership and investment, it is expected that ICT will be more readily transferred to all population segments. Privatization is another major ICT policy issue in Ethiopia. Government owns and manages key infrastructures needed for the transfer of online technologies like the telecommunications operator who provides phone-lines for Internet, website and e-mail. As governmental policies restrict privately-owned IT services, these can become unusually expensive and often lack quality due to absence of competition

Research on effects of ICT policy on online information pattern generally indicates that policies supporting ICT development will help growth of national bandwidth of online information or internet services

2.7. Challenges of Online information

Some of the challenges that public health information face when they are searching for information, as stud identified by Etsub (2009) technical knowledge and/or information illiteracy (mostly browser related navigation in the hypertext jungle); poorly developed search strategies and operations; misinterpretation of information; and slow down internet connection.

Study by Akesson (2007) viewed that the process of online information seeking is gradually increasing in sophistication as more services are placed online and the capacity of systems to provide extensive information increases. Arguments in the same attitude are expressed by Sirak, 2012 and Etsub, 2009 who argue that health professionals make use of online resources, such as URL and e-mail usage strategies refer to online skills. However, knowing only the URL and e-mail appear not to understand the nature of the services that they use, even while actively using these resources. Similarly, Sirak (2012) and Etsub (2009) have observed that while health professionals often demonstrate developed knowledge about specific sources relevant to their provision, in other respects they do not exhibit a profile of electronic information systems' use that differs much from other health care professionals. Marton (2011) declare that online searching skills are particularly problematic because of the challenges that the online information poses to health care values and traditional research practices. Consequently, the technical skills of online searching are often taught separately from left entirely unaddressed.

Likewise study by Marton (2011) that online sources challenge predictable corrective values. He believes that the web turns corrective conventions on their provision, absence of dating information, and the transience and variability of online texts in a medium that does not guarantee the ability to retrieve something.

2.8. Related Statistical Methods and Techniques

In terms of research methods, the reviewed studies have very common. First, all studies employed survey design including a postal mail survey (Yoo and Robbins, 2008), a telephone survey (Leung, 2008), and web surveys (Marton, 2011; Yun and Park, 2010). Second, convenience sampling was the predominant sampling technique. Third, all studies employed

one or more types of multiple regression for data analysis, most commonly hierarchical regression (Leung, 2008; Yoo and Robbins, 2008) or path analysis (Marton, 2011; Yun and Park, 2010).

With regard to sampling, the study needs to consider questions of sample size and sampling bias. Sample size varied somewhat across the studies, with Leung's random sample telephone survey (Leung, 2008) reporting the largest sample size. Sample size in relation to the number of study variables affects the statistical power of the study. For example, the sample sizes for Yun and Park's (2010) study may suggest insufficient power for multi variate regression analysis. The use of convenience samples could introduce sample biases. Both doctoral dissertation studies of women seeking health information indicated sample biases pertaining to one or more of the following demographic variables: age, education, occupation, and race (Yoo, 2004; Marton, 2011). But Leung (2008) did not report data on demographics, which is an interesting omission.

In comparing above related studies (Yoo, 2004; Marton, 2011and Leung, 2008), we found that online information use was influenced by public health provision and communication related to health care, particularly the health professionals' socio-demographic, perceived gratification sought, behavioral modification, internet self-efficacy, involvement, perceived online web based sources are the main predictors and positively correlated for healthcare provisions using multiple regression and path analysis models. They were undertaken to determine the direction, strength, and significance of these relationships, and to construct a new model that described this online information of relationships with healthcare.

In addition, studies (Marcoulides and Saunders, 2006; Straub et al., 2004 ;cited in Mengistu et al., 2007) revealed the models of statistical reliability analysis to produce Cronbach's alpha[10] for each similar measurement in order to perform the reliability test in items to remove (or modify). The study tested that the

[10] Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. A "high" value of alpha is often used (along with substantive arguments and possibly other statistical measures) as evidence that the items measure an underlying construct (Cronbach & Meehl, 2001).

discriminant validity using Partial Least Squares (PLS 3.0), a second-generation multivariate technique that allows for testing of psychometric properties of scales used to measure a variable, as well as the strength and direction of the relationships among variables. Specifically, we conducted convergent and discriminant validity, including Average Variance Extracted analysis.

According to Mengistu et al (2007) stated that the formula for the standardized Cronbach's alpha:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

Here N is equal to the number of items, c-bar is the average inter-item covariance among the items and v-bar equals the average variance. One can see from this formula that if online increases the number of items, increase Cronbach's alpha. Additionally, if the average inter-item correlation is low, alpha will be low. As the average inter-item correlation increases, Cronbach's alpha increases as well (holding the number of items constant).

2.9. Online Information Seeking and Use within Healthcare Environments

In a short space of time, the online information has grown from a marginal to a universal presence in hospital settings, and has been accepted by health professionals, who appear to use online information smoothly (Etsub, 2009). Her study was identified that health care service professionals have certain knowledge and skills of the online environment to disseminate and retrieve online help. Thus with the increased confidence on web-based systems, bibliographic databases, training in the online information and use of healthcare provision should be improved. Seeing as skills and strategies when using ICT especially online information for information seeking differ from traditional tools (navigation in a hypertext environment is substantially different from searching a library's index card or bookshelves), the need to equip users with high level search competencies must be attended to (Sirak, 2012). Accordingly, Mengistu ea al (2007) studied that the information seeking is a subset of information literacy. Without a conceptualization of what one is seeking, the exercise of seeking becomes superfluous. For this reason, the researcher feels that there is a need to conduct the online information seeking for better instructed in health care service

provision. Moreover, the level of support for information seeking offered to health professionals should increase.

2.10. Conceptual Framework

For this survey study, the research questions are developed based upon online information seeking from existing literature, and gaps in current research as indicated by scholars and health care professionals within the field. Information on online accessibility and use of online health information, health professionals understood through the different variables such as socio demographic variables in information needs, sources of online information and the outcome expectancies, perceived gratification sought, internet self-efficacy, credibility and reliability are placed with dependent variable of access to online health information (AOHI)[11] (Marton, 2011).

Also health professionals' online seeking habits, associated tasks which in turn determined the independent variables of socio demographic variables in information needs, sources of online information and the outcome expectancies. In addition, studies (Philip et al 2009; Manafo, 2012) was reviewed that uses and gratifications, internet self-efficacy and credibility and reliability of health professionals to disseminate and retrieve health information from existed or available internet sources in interactive manners. In accordance with the views of uses and gratifications, the study hopes to show that health professionals choose online health information over other sources based upon specific needs and wants that have solved problems of health communication or information flow. Internet self-efficacy, which is the confidence in to possess in his or her ability to navigate the online, determines the extent to which online health information is accessed and used (Warren et al 2010), and others have written extensively on involvement as an important variable in access and use of different online sources (Santosa et al, 2005). This study looked at cognitive and behavioral involvement of health professionals which would determine how much attention to use online messages, and how it affected their interest in online health information as looking for information, retrieving it, and using it lies at the heart of hospital settings.

[11] Frequency to use online health information

CHAPTER THREE
METHODOLOGY

3.1. Study Area and Period

The study was conducted in Addis Ababa from March 04, 2013-April 30, 2013. According to CSA (2007) report, about 3 million people are living in its 10 administrative sub cities. The city has 10 public hospitals and 34 private hospitals (FMOH[12] EFY, 2003). Of which, health and health related indicators of (FMOH EFY, 2003) reported to have access to basic health services, doctors and other health professionals are in very short supply: the doctor-to-population ratio is, 1:17,607, the health officer-to-population ratio 1:11,489, midwife to population ratio is 1:18598, and all nurses to population ratio is 1:942. The study reduces specified gap using online. Accordingly, the city has 10 administrative sub cities with facilities of 10 public hospitals, 34 private and 1 NGO hospitals.

3.2. Study Design

A cross-sectional study was used to conduct this study and both quantitative and qualitative methods are investigated.

3.3. Study Population

The sources of population for the study were health professionals working in health care service provision at private and public hospitals in Addis Ababa, Ethiopia. The study population were health officers, public health officers, nurses and midwife nurses and pharmacists/pharmacy technicians who are working in health care services at private and public hospitals whose qualification were Diploma and above that fulfill the inclusion criteria for this study. From private hospitals, Bethel and Landmark are selected. In the same way, Armed Force General Teaching Hospital (AFGTH) was selected from public hospitals that are administrated by FDRE government and Zewditu, Yekatiti 12, Menelik II and Ras Desta Hospitals were selected from public hospitals that are under administration of Addis Ababa City Health Bureau (AACAHB).

[12] Federal Ministry of Health

Sampling Procedures and Frame

Those private (two in number) and public hospitals (five in numbers) that are selected by simple random sampling with ensuring the availability of internet for health care provisions through the previous study (Etsub, 2009). Likewise, the study subjects were selected using proportional sampling method from determined population. Since the thesis attempted to create sample that would represent hospitals at different levels and different types of hospitals (government and private) and it identified 307 health professionals as potential participants.

To select the proportional sample size from each hospital, the study used list of health professionals' profile in respective human resources department (see table 3.1 below).

3.4. Inclusion Criteria

As discussed in above section (in section 3.3), this study focused on health professionals: health officers, public health workers, nurses, midwife nurses and pharmacist/pharmacy technician who are working at private and public hospital levels and whose qualifications are diploma and above in hospital settings. The reason for selection of these professionals and hospitals is that internet services are most likely to be accessed in hospitals level than other level of health institutions (Etsub, 2009). In addition to this, most health professionals are likely to be aware of information technology literacy at hospital level rather than other health institutions.

3.5. Exclusion Criteria

Health professionals whose qualification is below diploma and physicians were not considered in this study due to time and budget constraint. What is more is that online information seeking behavior of physicians is already studied by Etsub (2009). Health professionals who were absent during data collection period were not included in the study.

3.6. Sample Size

Sample size for the study was determined using the following formula that was used by different studies (Cochran, 1977) and the result is presented in table 3.1 below. For this study, quantitative variables used to calculate the sample size with an estimated proportion of internet use as p=0.5 and proportion not use the internet as q=0.5 with 5% marginal error and

95% confidence interval. Therefore, the study used the Cochran's formulas to determine the sample size from the study population (Cochran, 1977).

$n_o=(Z^2(pq))/d^2$, where (pq)=estimated of variance, p= probability of online user and q=1-p (probability of failure or non-online user) but the study is the first for the study area, therefore the study used value of p=0.5, q=0.5 and z= value for selected alpha level=1.96 and d (acceptable margin of error) =0.05 within 95% confidence interval.

$\left(n_o=(Z^2(pq))/d^2\right)= \left(1.96^2\right)(0.5*0.5)) =384.16 \approx 385$

Accordingly, Cochran (1977) pointed out that if sample size exceeds 5% of the population then use the formula: (given target population (N) = 1009, where 5%*1009=51, so 385>51, then the researcher uses this formula) as: $n=\frac{n_0}{(1+\frac{n_0}{population})}$, where n = required return sample size. Since our sample exceeds 5% of target population, the sample size was

$$n=\frac{385}{(1+\frac{385}{1{,}009})}=279$$

For non-respondent rate, the study used 10%*279= 28, total sample size (n) was 279+28=307 However, respondents from each hospital were selected by using of convenient sampling method based on their interest to use internet.

Table 3.1: Total Target Population for Quantitative Study

Profession	Selected Addis Ababa Public Hospitals					Selected Private Hospitals in Addis Ababa	
	Zewditu Memorial	Ras Desta Memorial	D/Menilik II Hospital	Yekatit Hospital	Defense Hospital	Bethel General Hospital	LandMark Hospital
Health officers	11	4	10	14	12	5	7
Pharmacist	9	6	5	8	6	4	6
Pharmacy Technician	5	5	7	5	4	3	4
Nurse BSC	55	67	76	80	79	56	45
Clinical Nurse	83	29	103	86	28	4	12
Midwife Nurse	19	0	0	14	21	5	7
Total nurses	157	96	179	180	128	65	64
Totals	182	111	201	207	150	77	81
Sampling techniques	182*307 /1009	111*307 /1009	201*307 /1009	207*307 /1009	150*307 /1009	77*307 /1009	81*307 /1009
sampled size (n)	55.38≈55	33.77≈34	61.16≈61	62.98≈63	45.64≈46	23.43≈24	24.65≈25

Where, total target population (N) =1009, sampled size (n) =307

Source: Department of human resources records in in each hospital about Health professionals in health and related indicators, FMOH Report of EFY, 2003.

From the above table 3.1, the study determined that the proportion of sample size techniques to address each element based on strata, while the study used purposive sampling method to collect data from specified strata by considering the internet users for healthcare provision.

3.7. Study Variables

Based on the research questions, the variables of the study were:

Independent variable/ explanatory variables:

Independent variables for this study were socio-demographic characteristics, use of online health information, behavior modifications, gratifications sought, internet self-efficacy, cognitive and behavioral involvement, outcome expectancy and credibility in online sources.

Dependent variable or outcome variables

The dependent variable is an important variable that helps to see the relation within independent variables. Therefore, the dependent variable in this study is access to online health information (AOHI)[13]

3.8. Data Collection Methods, Tools and Instruments

Data were collected using self-administered questionnaire by reviewing previous similar studies (Leung, 2008; Marton, 2011 and Etsub, 2009). In addition, relevant questionnaire related to the objective of the study has been added. Accordingly, the self-administered questionnaire prepared in English language which was used as tool for data collection. This self-administered questionnaire was developed and measured in five-point Likert Scale, such as "Strongly Agree," "Agree," "Don't know/can't say," "Disagree," and "Strongly disagree" (Warren et al, 2010 and Eastin and LaRose 2004). The responses were coded with numerical values from 1 to 5 with 1 being "Strongly Agree" and 5 being "Strongly Disagree:" (See Appendix A).

3.9. Data Collection Procedures

Before distributing the questionnaire, each hospital's administrator was informed about the study by means of permission letter and ethical clearance form from AAU that briefly stated the purpose of the study and its significance. Then the questionnaires were sent to each

[13] The Intensity (Frequency) of Seeking Healthcare Information on the online information or internet usage

hospital administrator and medical director. After getting full permission from each hospital administrator and medical director, data was gathered using the self-administered questionnaire. The data collectors approached respondents by welcoming and introducing themselves with explaining of the purpose of study verbally. Respondents completed some immediately; data collectors collected some later; no responses were returned via missing values. Since data was collected by voluntary health professionals in respective hospitals (See Appendix A).

3.10. Data Quality Control

The questionnaire was prepared in English and it was checked by English professional and ICT consultants to ensure its consistency. The data collectors share their problems when collecting data with the researcher. Moreover, the missing values were refilled by respondents through communication of data collectors. Then this process helped in maintaining the quality of the data before it was entered and analyzed.

3.11. Data Processing and analysis

The collected quantitative data was first checked for its completeness then analyzed using SPSS 15 software. Relationships between variables were interpreted using correlation, multiple regressions, cross-tabulation and chi-square tests. Regression coefficient measures the amount of change in the dependent variable when an independent variable increases one standard deviation while other independent variables are held constant, regardless of how they are scaled. Second, predictive power is examined by considering the reported model's coefficient of multiple determinations (R^2), which measures the proportion of variance in the dependent variable explained by the independent variables collectively. Accordingly, factor loading in data reduction and cronbach alpha were considered to measure reliability scale analysis. To do this, the study looked at different survey studies such as Yoo and Robins, 2008; Leung, 2008; Yun and Park, 2010; Marton, 2011 and Mengistu et al., 2007 in the literature reviews.

3.12. Data Compilation

Data were statistically subjected to factor analyses[14] that are closely related items. The factor analysis method were used to condense the number of variables in the following eight sections of the questionnaire: Socio-Demographic characteristics and selected hospitals, use of online health information, behavior modifications, gratifications sought, Internet self-efficacy, cognitive and behavioral involvement, outcome expectancy and credibility in online sources. Specific results of the analysis are listed below except the socio-demographic characteristics and selected hospitals by using factor loading analysis, which includes reliability analysis, guided its adjustments for main study. When convergent reliability and Cronbach's alpha met the threshold value of 0.70, items were kept in similar variables and the Eigen value for each collapsed similar item was statistically taken as one and above (see in tables 3.2 to 3.7 below). After conducting various analyses, these steps were taken to finalize the instrument for the main survey as (Stevens, 2002; Harry and Deborah, 2012):

- items in value of below 0.70 loaded poorly on respective factors based on reliability analysis were dropped or modified;
- detailed qualitative comments from respondents were carefully examined to guide instrument revisions;

3.12.1. Use of Online Health Information

Participants were questioned on their cognitive indication of online seeking through seven items in the questionnaire. Factors analysis resulted in one factor with eigenvalue of 1 or greater. The factor is labeled as use of online information. The findings of the factor analysis were presented in table 3.2 below. Items having factor loading in Cronbach's alpha of 0.70 or greater are included in the resulting factor. This fact depicted that most respondents in the study are interested to improve healthcare provision through use of online information (see table 3.2).

[14] It helps to measure the intervals likert scale between the responses like strongly agree to strongly disagree (Agresti & Finlay, 2009).

Table 3.2: Factor Analysis in Use of Online Health Information Items

Item	Factor Loading
Use of Online Information	1
I would like to....	
get information for better health and prevention	0.890
spend time thinking about information that I retrieved from the online before making health related decision	0.784
- get information that helps me understand better what I can handle for healthcare concern	0.788
- discuss information online with other doctor/ healthcare provider	0.870
frequently go back to the internet for follow up information on the healthcare provision	0.562
- spend time determining the significance of health of online information that I get before making health related decision	0.780
- save/Store/print health related information from internet	0.407
Eigen value	2.14
Variance explained	60.60%
Total Variance explained by two factors= 60.60%	

3.12.2. Behavior Modifications

Behavior modifications were measured through two items in the questionnaire, and factor analysis yielded a factor with eigenvalues of one or greater. The factor is getting preventive healthcare tests. The results of the factor analysis are presented (in table 3.3 below) and consist of only item having factor loadings in Cronbach's alpha level of 0.70 or greater.

Table 3.3: Factor Analysis of Behavior Modifications Items

Item	Factor Loading
	1
Based upon online health information I …	
1. **Getting Preventive Healthcare Tests** - got additional health related tests relevant to general healthcare provision - got healthcare attention promptly when needed	 0.869 0.896
Eigen Value	1.59
Variance Explained	52.82%
Total Variance Explained by a factor=52.82%	

3.12.3. Gratifications Sought

There were twelve items in the questionnaire that measured satisfaction required by respondents, which resulted into four factors with eigenvalues of one or greater through factor analysis. The four factors are; ease of information seeking, empowerment, self-health management & privacy, and online social networking. The results of the factor analysis, which only consist of items having factor loadings of 0.70 or greater, were presented (See table 3.4 below).

3.12.4. Perceived Online Information Credibility and Reliability

Perceived credibility and reliability of health information were measured through ten items on a scale, and the factor analysis yielded three factors with eigenvalues of 1 or greater. The three factors are credibility of online sources, peer-network influence in online source credibility and passive approach to Credibility. These factors with loadings of 0.70 or higher were presented in (See in table 3.5)

Table 3.4: Factor Analysis of Gratifications Sought Items

ITEM	Factor loading			
I seek online information because it allows me to…	1	2	3	4
1. Empowerment				
- keep up with development of healthcare	.599			
-get information in the privacy	.641			
-get variety of information from different sources	.655			
- get fast dissemination and retrieve up to date healthcare information	.708			
2. Ease of Information Seeking				
- Evaluate/assess information at my own pace		.815		
- Comprehend information on my own time		.810		
- Comprehend information at my own pace		.588		
- Instantly Retrieve information as and when I need it		.609		
3. **Self-health Management & Privacy**				
- supplement information that I get from my co-worker/healthcare provider			0.627	
- get a earliest diagnostic through self-diagnostic application			0.512	
- retrieve information secretly			0.866	
4. Online Social Networking				
- get support and advice from other healthcare professionals and online communities in similar health contexts				.852

- offer support and advices for specific information on the internet				.801
Eigen Value	2.48	2.28	1.79	2.07
Variance Explained	17.76%	16.30 %	14.81%	12.80%
Total Variance Explained = 61.67%				

Table 3.5: Factor Analysis of Internet Self-efficacy Scale

ITEM	Factor Loading	
	1	2
Confidence in Messaging and Retrieving Information		
- I can comfortably send and receive e-mail message	0.768	
- I feel confident looking for general information on the online information	0.748	
- I can understand terms/words related to internet software like Mozilla Firefox, opera, internet explorer, etc.	0.686	
- I can downloading materials and files from internet	0.781	

2. Confidence in Internet Navigation and File Sharing - I can upload the files and documents to internet using E-mail and websites		.757
- I can trouble shooting internet problems		-.139
- I can use Video conference when it needed		.747
- I can use health related database site like pubmed MEDWB.com, ,Medline, HINARI, etc		.585
Eigen Value	2.074	2.067
Variance Explained Total Variance Explained =51.768%	25.93%	25.84%

Table 3.6: Factor Analysis of Involvement Scale

ITEM	Factor Loading	
	1	2
1.Cognitive Involvement Related with Pertinent Health Information		
- I go to online doctors to seek professional help rather than try to treat in myself	.759	
- Instead of waiting for others to tell me, I usually ask the doctor/other health professionals in online immediately	.807	
2.Information Seeking from Experts		
- I trust in experts/doctor advice rather than in common sense in treating in my self		.604
- I familiar with using of search engine like Google, YouTube, yahoo, skype, etc. when I need professional help for healthcare provision		.729
- I usually ask the health professionals in the web a lot of questions about the procedure during or before the healthcare decision	.412	-.124
- I would be given many choices about what is best for healthcare provision		.713
Eigen Value	1.91	1.57
Varian e Explained	27.25%	22.49%
Total Variance Explained= 49.75%		

Table 3.7: Factor Analysis of Outcome Expectancy Scale

ITEM	Factor Loading		
	1	2	3
Outcomes of Information Seeking			
- I become overwhelmed with information concerning healthcare provision when using online information	.558		
- I belief online health information is too complex in order to understand	.774		
- I have difficult in understanding information was difficult with large volume of information	.862		
- I am concerned with how online health information fits with specific healthcare provision	.605		
2. Anxiety Related to Credibility and Reliability			
- I get concerned about trustworthiness of online information sources like Facebook, YouTube, Skype, e-mail, etc.		.735	
- I am concerned that some online information is biased because it provides decentralized interest of drug companies and others		.616	
- I get concerned about protection and privacy of health related information using online		.640	
3. Positive Outcomes Related to Networking and Learning			
- I am satisfied with the use of internet as tools of health information			0.698
- I am satisfied with use of internet as a learning tool for health information			0.546
- I am satisfied with use of internet as network tools for health information	.		0.777
Eigen Value	2.38	2.23	1.57
Variance explained Total Variance explained by three factors= 61.806%	23.76 %	22.30 %	15.75 %

Item	Factor Loading		
	1	2	3
Credibility of Online Sources			
- If the website is sponsored by healthcare institution, I check the authorization	.576		
- I always check the author of the health website I visit	.777		
- I frequently check how a website is rated to online health communities	.730		
- I almost always check the "About Us" section of the health website that I visit	.576		
- I only visit websites belonging to reputed health organization	.768		
Peer-Network Influence on Online Source Credibility			
- I recommend websites I find reliable to family and friends		.712	
- I visit websites recommended by my co-workers and other health care professionals		.832	
- The information on websites that I frequently visit is credible		.502	
Passive Approach to Credibility			
- I do not care credibility of the source is as long as the information makes common sense			.812
- The information on the web site that I frequently visit is not credible		.	.51

Eigen Values	1.72	1.69	1.68
Variance Explained	21.51%	21.17%	21.04%
Total variance Explained= 63.72%			

3.12.5. Reliability Analysis

All the items that loaded on the respective factors of the constructs; use of online health information, behavior change, gratifications sought internet self-efficacy, involvement, outcome expectancy and credibility of information, represented in tables 3.2 to 3.7 above were combined to construct summative scales. These scales were then subjected to a reliability analysis, the results of which are presented in table 3.8 below. Reliability was determined through the scores of Cronbach's alpha, which determines the internal consistency of the similar items scale. Cronbach's alpha is a coefficient of reliability and measures how consistently in the scale measure to each item. Only factors with Cronbach scores of 0.70 or higher were retained for further analysis in this study. Three from fifteen scales need modification or training of online to meet the minimum threshold value of Cronbach's alpha while twelve from fifteen scales satisfies the minimum threshold value of online information seeking, (see in table 3.8 below).

Table 3.8: Reliability of Analysis of the Factors

Constructs /Factors/Scales	Cronbach Alpha
Use of Health Information Usage	
Use of Online Health Information	0.71
Behavior Modifications	
Getting Preventive healthcare Tests	0.75
Gratifications Sought	
Ease of Information Seeking	0.70
Empowerment	0.63
Self-health Management & Privacy	-0.38
Online Social Networking	0.73
Internet Self-efficacy	
Confidence in Messaging and Retrieving Information	0.65
Confidence in Internet Navigation and File Sharing	0.34
Involvement	
Cognitive Involvement related with Pertinent Health Information	0.65
Information Seeking from Experts	0.25
Outcome Expectancy	
Outcomes of Information Seeking	
Anxiety Related to Credibility and Reliability	0.76
Positive Outcomes Related to Networking and Learning	0.50
	0.50
Perceived Credibility and Reliability	
Credibility of Online Sources	0.51
Peer-Network Influence on Online Source Credibility	0.59

3.13. Operational Definitions

Research in the field of online and health has previously defined and explained several terms used in this study (Cullen, 2006 and Tang & Lee, 2006). Those definitions have been modified to fit the needs of the study.

- **Access to online health information:** it is defined as health professionals' intensity to use internet and actively seeking online websites for healthcare provision.
- **Empowerment**: refers to the level of choice, influence and control that users provide health services can exercise over events in their communication.
- **Behavior modifications** are defined as the interactive changes that health professionals undertake in their confidence to disseminate and retrieve information through online access.
- **Gratifications sought** are defined as the needs and wants of healthcare professionals that is expected to be achieve by the use of online health information or their desired satisfaction when using online information.
- **Health Professional**: refers to health officers, nurses and pharmacists/pharmacy technicians who work in healthcare provision.
- **Internet self-efficacy** is defined as the confidence of health professionals in capability to use online for health information.
- **Outcome expectancies** are defined as the end results expected by health professionals as a consequence of their online health information seeking behavior.
- **Perceived credibility and reliability** are defined as the efforts of users put in determining the trustworthiness and consistency in online health information sources based upon their perceptions.
- **Use of online health information** is awareness indication of internet use reported by health professional.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1. Findings

4.1.1. Characteristics of Hospitals and Respondents

When the study is conducted in Addis Ababa on totally 307 selected respondents, of which 63 (20.5%) work in Yekatit 12 Hospital, 61 (19.9%) work in D/Menilik II Hospital, 55(17.9%) work in Zewditu Memorial Hospital and the rest (41.7%) were selected from Defense Referral, Ras Desta Memorial, LandMark and Bethel General Teaching Hospitals (see in table 4.1 below).

Table 4.1: Socio-Demographic Profile of the Respondents and Selected of Health Facilities

Name of Selected Hospitals		Frequency	Percent
Valid	Bethel General Teaching Hospital	23	7.5
	D/Menilik II Hospital	61	19.9
	Defense Referral and Teaching Hospital	46	15.0
	Land Mark General Hospital	25	8.1
	Ras Desta Memorial Hospital	34	11.1
	Yekatit 12 Hospital	63	20.5
	Zewditu Memorial Hospital	55	17.9
	Total	307	100.0
Sex of Respondents		Frequency	Percent
	Male	136	44.3
	Female	171	55.7
	Total	307	100.0

Demographic Variable		Frequency	Percent
Age	15-25	95	30.9
	25-35	180	58.6
	35-45	32	10.4
	>55	-	-
	Total	307	100.0

Position of Respondent		Level of Education			Frequency	Percent
		Bachelor Degree	Master degree	Diploma		
	Nurse B.Sc	160	-	-	160	52.12
	Clinical Nurse	-	-	51	51	16.61
	Midwife Nurse	-	-	26	26	8.50
	Health Officers	19	-	-	19	6.2
	Pharmacist	18	-	-	18	5.9
	Public Health	3	14	-	17	5.50
	Pharmacy Technician	-	-	16	16	5.2
Total		200	14	93	307	100

4.1.1.1. Sex of Respondents

From table 4.1 above, the respondents' sex is unequally distributed with 171 (55.7%) of internet users being females while 136 (44.3%) of internet users are males. Most of respondents in this thesis are female participants and the results helps to know which sex group is more interested to use internet for health care provision.

4.1.1.2. A Description of Study Population in Age Group

As table 4.1 indicated that the age of the respondents ranges from 15-65. Respondents with in age group from 25-35 appear to be highly engaged in online information seeking. They are 180 in figure (i.e. 58.6%); age group of 15-25 followed by 95 (30.9%) and age group of 35-45, the third by 32 (10.4%) (See table 4.1 above).

4.1.1.3. Education Levels and Position of Respondents

As presented in table 4.1 the respondents education level distributed on 200 (65.0%) Bachelor Degree, 97 (30.3%) diploma and 14 (4.6%) Master's Degree. None of the respondents has had Ph.D. degree in her/his field of study. Similarly, this study reveals a large number who have completed their bachelor degree with position of nursing (B.Sc, Clinical and Midwife) of 77.3% while 22.7% of the respondents are Health Officers, Health professionals, Pharmacists and Pharmacy technicians (see table 4.1 above).

4.1.2. Interest of the Respondents to Use the Internet

4.1.2.1. Accessibility of the Internet

As presented in table 4.2 below, 37 (12.1%) of the respondents indicated that they access the internet from only home, 64 (20.8%) access internet from only work place, 164 (53.4%) access internet from both home and work Place and 42 (13.7%) access internet from only internet café (see table 4.2).

Table 4.2: Place where Internet Used by Health Professionals

Place of Internet used	Frequency	Percent
At only Home	37	12.1
At only Work place	64	20.8
At internet Café	42	13.7
At both Home and Work Place	164	53.4
Total	307	100.0

4.1.2.2. Internet Availability in the Hospitals

Table 4.3 summarizes the responses to scale of availability of internet in the selected hospitals of Addis Ababa along with frequency distribution as 269 (87.6%) agrees on availability of internet in the hospitals while the other 38 (12.4%) response didn't agree on availability of internet. In addition to this in the same table a question analyzed about the satisfaction of internet accessed category in each hospital. As their responses discussed with broadband internet 249 (81.1%), while 36 (11.7%) of internet connection dial up and 22 (7.2%) of the respondents answered as "don't know" about internet category (see table 4.3 below).

Table 4.3: Availability of Internet and its Type in the selected Hospitals

Check availability		Frequency	Percent
Valid	Yes	269	87.6
	No	38	12.4
	Total	307	100.0
	Internet category		
Valid	Broadband	249	81.1
	Dial Up	36	11.7
	Don't Know	22	7.2
	Total	307	100

4.1.2.3. Access to Online Health Information

It is shown on table 4.4 that 156 (50.8%) respondents visit health websites for less than two hours; while, 128 (41.7%) visit health websites from two to four hours. Another 19 (6.2%) of the respondents visit between four to six hours looking for online health information and 7 (2.3%) visit more than six hours. Therefore, this study identified that most of respondents visit online less than two hours per day in order to retrieve and disseminate health information (see table 4.4 below).

Table 4.4: Access to Online Health Information

Frequency to use online	Frequency	Percent
less than two hours	156	50.8
two to four hours	128	41.7
four to six hours	19	6.2
more than six hours	7	2.3
Total	307	100.0

4.1.2.4. Accessibilities of E-mail Lists

Communication has been identified as one of the main reasons health professionals go online. There is a growing preference for the use of the e-mail in healthcare information correspondence. As presented in table 4.5 below, the e-mail subscription from the respondents

also answered whether they actively subscribed to any e-mail lists on health-related websites for information. Around 281 (91.5%) respondents believed that they subscribed in e-mail lists while the rest of 8.5% of respondents haven't subscribed in e-mail list from related health web sites (see in table 4.5).

Table 4.5: Respondents' E-mail list Subscription * Position of Respondent Cross Tabulation

		Position of Respondent							Percent
		Nurse B.Sc	Clinical Nurse	Midwife Nurse	Health Officer	Pharmacist	Public Health officer	Pharmacy Technician	
E-mail list Subscription	YES	149	41	24	19	18	17	13	91.5
	NO	11	10	2	0	0	0	3	8.5
Total		160	51	26	19	18	17	16	100

4.1.2.5. Online Information Sources

As indicated in table 4.6 below free search engine like Google, Msn, etc. are being used as the most consulted source by the health professionals. This is confirmed by the majority of the respondents' i.e. 128 (41.7%) are using of free search engine, both free search engine and Bibliographic database like PUBMED with 88 (28.7%) and only bibliographic database like PUBMED, Medline was rated by 28.3% as the third source of online. Other sources consulted by the health professionals are 4(1.3%). The fact indicates that free search engine like Google is the main searching engine than other sources.

Table 4.6: Kinds of Health Database Search Engine from Online

Online Databases	Frequency	Percent
Bibliographic database like PubMed, Medline	87	28.3
Free Search Engine like Google	128	41.7
Both Bibliographic and Free Search Engine	88	28.7
if others, specify	4	1.3
Total	307	100.0

4.1.2.6. Health Database Sources

In addition, table 4.7 summarizes online databases sources as HINAR data base is the most consulted data base. This has been confirmed by 74 (24.1%), the next source is MEDLINE database by 73 (23.8%) and 19.9% is Both PUBMED and MEDLINE, 11.4% used both PUBMED and HNARI, 14 (4.6%) while all of the given public health databases are accessed by 4 (1.3%). (See table 4.7 below)

Table 4.7: Health Database Sources

Health Database sources	Frequency	Percent
PUBMED	46	15.0
MEDLINE	73	23.8
HINARI	74	24.1
Both PUBMED and MEDLINE	61	19.9
Both MEDLINE and HINARI	14	4.6
PUBMED and HNARI	35	11.4
All sources	4	1.3
Total	307	100.0

4.1.2.7. Respondents Online Seeking Habit

The rate of respondents in figure 1 indicated that health professionals seeking habit measured with most of the respondents (66.12%) believed that they are good, 32.57% of the respondents believed that they are very good while 1.3% of them are poor in using online information.

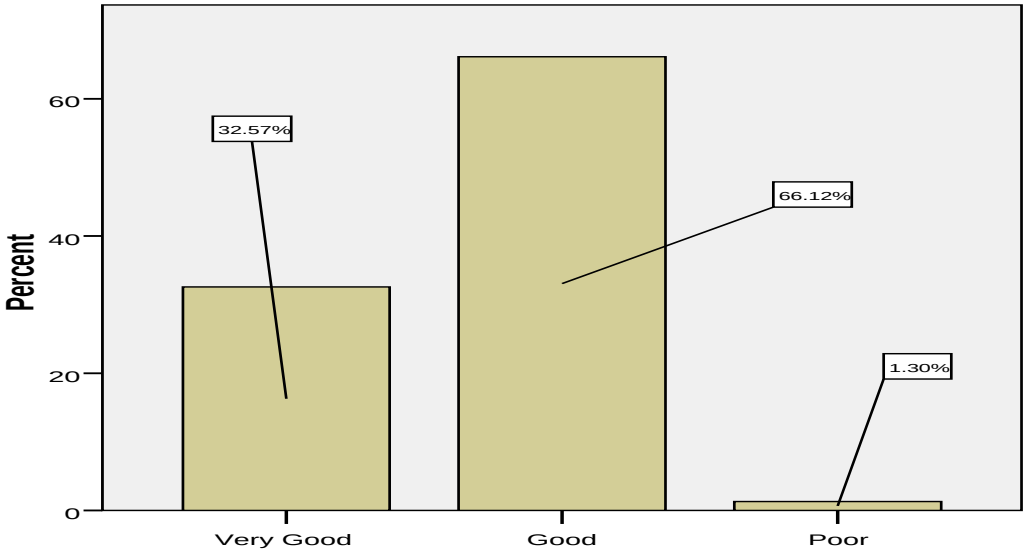

Fig 1: Rate of usage in internet efficiency

4.1.3. Online Information Seeking Behavior

The mean score in table 4.8 indicated that there is high level use of online health information among the respondents. Give special attention that the distribution of low composite mean and standard deviation score has received the first rank and constructs with the subsequent higher averaged means and standard deviation were assigned the subsequent lower ranks in seeking of online information.

4.1.3.1. Use of Online Health Information

The results identified that standard deviation (0.069) and combine mean score of (1. 73) which number in use of online information for healthcare provision.

4.1.3.2. Behavior Modifications

The responses to the behavior modifications questions have been collapsed into the a scale; getting preventive healthcare tests which are presented in table 4.8 along with the mean scores of (1.61) and standard deviation of (0.023). The result showed that the behavior modifications

scales of health professionals about online use by getting preventive healthcare tests (see table 4.8)

4.1.3.3. Gratifications Sought

The communication interest behind the selection of a particular online sources is at the center of any health professionals' activity, and therefore particularly satisfaction in this study which has a theoretical foundation in intention to use and gratifications. Consequently, the research question is solved to explore the various perceived gratifications sought by health professionals from accessing online health information. Data were subjected to a factor analysis that yielded four factors; ease of information seeking, empowerment, self-healthcare management & privacy and online social networking. In relation to this, the mean responses of the scales related to gratifications sought also collapsed as; ease of information seeking, empowerment, self-health management & privacy, and online social networking as exhibited in table 4.8 below. The result that showed in the composite mean scores, standard deviation, and rank of scale in the table 4.8 is scored toward the degree of gratifications sought from online health information. The column shows the rank for each construct based upon averaged mean and standard deviation. Ease of information seeking ranks the highest with lowest variations of (0.019), followed by empowerment (0.026), online social networking (0.028) and self-health management & privacy (0.09) follow within the third and fourth rank respectively (See table 4.8).

4.1.3.4. Internet Self-efficacy

In similar fashion, table 4.8 summarizes that for internet self-efficacy, the confidence in messaging and retrieving information highest significant with ranked first and confidence in internet navigation and file sharing. In the same table depending on average mean and standard deviation for involvement, information seeking from experts highly signifies with ranked first while cognitive involvement related with pertinent health information followed with second rank.

4.1.3.5. Outcome Expectancy

The responses to the outcome expectancy construct resulted in three scales; outcomes of information seeking, anxiety related to credibility and reliability, and positive outcomes

related to networking and learning, which are presented in table 4.8 below along with the mean scores of the scales, standard deviation and rank of scale. They are then each ranked accordingly. The column in the table showed the rank for each scale. The construct of positive outcomes related to networking and learning has been assigned the first rank, outcomes of information seeking has been assigned the second rank, and anxiety related to credibility and reliability was assigned the third rank.

4.1.3.6. Perceived Online Information Credibility and Reliability

The mean responses to the scales on perceived credibility and reliability of respondents are, credibility of online sources, and peer-network influence on online source credibility are exhibited in table 4.8. The result summarizes that the mean scores and standard deviation and the rank of each scale. The column shows the rank for each construct based upon average mean and standard deviation, peer-network influence on online source credibility ranked first, followed by credibility of online sources

Table 4.8: Combined Mean, Standard Deviation (SD) and Rank to Online Seeking Behavior

Online Seeking Behavior	No of items	Mean (SD)	Ranked
Use of online Health Information			
Use of Online Health Information	7	1. 73(0.069)	8
Behavior Modifications			
getting preventive healthcare Tests	3	1.61(0.023)	4
Gratifications Sought			
Ease of Information Seeking	6	1.54 (0.019)	3
Empowerment	3	1.70 (0.026)	6
Self-health Management & Privacy	6	2.71(0.09)	15
Online Social Networking	3	1.70 (0.028)	7
Internet Self-efficacy			
Confidence in Messaging and Retrieving Information	4	1.48 (0.033)	1
Confidence in Internet Navigation and File Sharing	5	2.06 (0.22)	10
Involvement			
Cognitive Involvement related with Pertinent Health Information	5	2.06 (0.216)	11
Information Seeking from Experts	4	1.85 (0.033)	9
Outcome Expectancy			
Outcomes of Information Seeking	4	2.37 (0.837)	13
Anxiety Related to Credibility and Reliability	3	2.14 (0.019)	12
Positive Outcomes Related to Networking and Learning	3	1.67 (0.042)	5
Perceived Credibility and Reliability			
Credibility of Online Sources	5	2.54 (0.24)	14
Peer-Network Influence on Online Source Credibility	4	1.52 (0.034)	2

4.1.4. The Relationship between Access to Online Health Information and Behavior Modifications

In this study, a scale with 9 questions has been developed to measure self-reported changes in behavior of respondents. This scale has been then subjected to correlation coefficient, which has resulted as; getting preventive healthcare tests has been correlated with access to health information (see table 4.9).

Table 4.9: Correlations between Behavior Modifications and Access to Online Health Information

	Behavior Modification		Access to Health Information Per Day
Kendall's tau_b	got additional health tests relevant to healthcare provision	Correlation Coefficient	.046
	got Medical Attention promptly when needed	Correlation Coefficient	-.002
	got additional healthcare tests related relevance	Correlation Coefficient	.119(*)
		N	307

* Correlation is significant at the 0.05 level

Results in table 4.9 summarizes that there is positive relationships between behavior modifications (specially, respondents in proving additional healthcare tests relevant to healthcare provision (0.046) and got additional healthcare tests related to relevance (0.119)) and access to online health information. However, there is negatively relation between …got medical attentions promptly when needed and Accesses to Online Health Information correlated by negatively (-0.002) (see table 4.9 above).

4.1.5. Access to Online Health Websites

The respondents have been asked to name their top three choices of websites that they most frequently visited, with 1 being the most frequently accessed, 2 being the next most frequently accessed and 3 being the last most frequently accessed. Tables 4.10, 4.11 and 4.12 have presented the frequency distributions for the three choices respectively. Responses for all three choices have been classified into different categories as explained below:

Social Online Site: These sites have been well selected for the use of online interaction among respondents to share their ideas and faced problems. These sites will provide health information easily and simultaneously without limiting the geographical distances in healthcare provision. The sites include www.facebook.com, www.YouTube.com, www.Skype.com, www.Twitter.com, etc.

General health websites: This category consisted of websites that provided broad healthcare provisions, and talked about general health and wellness or public health concern. Examples include www.healthcentral.com, www.prevention.com, and so on.

Government sponsored websites: These websites contain general health information provided by government organizations and health-related agencies. Websites in this category include www.cdc.gov, www.medlineplus.gov, www.hinari.gov, www.fmoh.gov.et, etc.

Health concern specific websites: Websites that provide for health-care professionals with a particular health concern, and provide information on the disease or problem were included in this category. Examples of websites in this category are www.diabetes.org, www.cancer.gov, www.arthritis.org, etc.

Hospital websites: This category consists of websites belonging to hospitals and medical facilities. Examples include websites like www.landmarkhospital.org , www.bethelhospital.org , www.defensegenhospital.gov.et, www.mayoclinic.org, www.johnhopkinsuniversity.edu, etc.

Pharmacy/ pharmaceutical company websites: Websites in this category consists of information on prescription availability and/or prescription coverage. This category included websites like www.medcohealth.com, www.daca.gov.et, www.fmhaca.gov.et /aboutdacanew.html and so on.

Search engines: A popular method of information retrieval is key-word searches in search engines. Included in this category are popular search engines like Google, Yahoo!, msn, AOL, Ask, and Wikipedia, etc.

Insurance Company Website: Data suggested that health professionals frequently visit insurance websites like www.aetna.com, www.medmutual.com, www.anthem.com, www.bcbs.com (Blue Cross Blue Shield), etc

Other: This category includes websites that are not technically health websites but may carry health-related content. Examples of websites include media websites like www.erta.gov.et, www.cnn.com, www.bbc.uk, and so on.

As table 4.10 shows, the frequency distribution in healthcare provision among the respondents who look for information using the website sources, majority respondents choice of WebMD, PUBMED and HINARI of 138 (45.0%) have been their first choice, followed by key word searches in search engines and pharmacy related websites of 36 (11.7%), Insurance websites 11(3.6%). Thirty-three respondents (10.7%) selected others, 14 (4.6%) identified websites containing general health and information as their first choice and 12 respondents (3.9%) go to hospital websites (See table 4.10 below).

Table 4.10: Frequency Distribution of First Choice of Health Websites

Choice of First Health Websites	Frequency	Percent
Social Online information	9	2.9
General Health Website	14	4.6
Government Website	8	2.6
Health Concern Specific Website	10	3.3
Hospital Website	12	3.9
Insurance Company Website	11	3.6
Pharmacy Related Website	36	11.7
Search Engine/Topics Search	36	11.7
WebMD, PUBMED and HINARI	138	45.0
Others	33	10.7
Total	307	100.0

The frequency distribution of websites that appear as second choice of respondents is illustrated in table 4.11. Accordingly, general health websites appear as the top preference for 78 (25.2%) respondents followed by key word searches in search engines and insurance company websites having an equal number of 62(20.2%) respondents. WebMD, PubMed and HINARI appear with the choice of 16 (5.2%) respondents and 26(8.5%) respondents go to hospital websites. Twelve respondents chose government websites (3.9%), 10(3.3%)

respondents have been chosen social online websites and 22(7.2%) respondents have been chosen health concern specific websites, Pharmacy websites were preferred by 13(4.2%) respondents and other websites respondents chose 6 (2.0%) (See table 4.11)

Table 4.11: Frequency Distribution of Second Choice of Health Websites

Second Choice of Health Website	Frequency	Percent
Social Online information	10	3.3
General Health Website	78	25.4
Government Website	12	3.9
Health Concern Specific Website	22	7.2
Hospital Website	26	8.5
Insurance Company Website	62	20.2
Pharmacy Related Website	13	4.2
Search Engine/Topics Search	62	20.2
WebMD, PUBMED and HINARI	16	5.2
Others	6	2.0
Total	307	100.0

Finally, the third choice of websites indicated in table 4.12, 70 (22.8%) respondents use search engines while 59(19.2%) respondents frequent general health websites. 47(15.3%) respondents indicated hospital websites and 33(10.7%) respondents have indicated insurance websites choice. Pharmaceutical company and governmental website have been chosen by 17(5.5%) respondents.

Table 4.12: Frequency Distribution of Third Choice of Health Websites

Third Choices	Frequency	Percent
Social Online information	8	2.6
General Health Website	59	19.2
Government Website	17	5.5
Health Concern Specific Website	28	9.1
Hospital Website	47	15.3
Insurance Company Website	33	10.7
Pharmacy Related Website	17	5.5
Search Engine/Topics Search	70	22.8
WebMD, PUBMED and HINARI	19	6.2
Others	9	2.9
Total	307	100.0

Once the frequency distributions are generated, each of the three choice variables were subjected with bivariate correlation (2-tailed significance level of 0.01). The bivariate correlation tests for all three choices have been shown in table 4.13 below. Table 4.13 summarizes that the second and the third choice of website is the most significant with (r=0.912), the first and third choice of website is second significant within (r= 0.886), and the first and second choice of websites followed with thirdly preferable (r=0.861) (see table 4.13 below).

Table 4.13: Bivariate Relationships of Choice of Health Websites

	Bivariate Relationships		First Choice of Health Website	Second Choice of Health Website	Third Choice of health website
Kendall's tau_b	First Choice of Health Website	Correlation Coefficient (r)	1.000	0.861(**)	0.886(**)
		Sig. (2-tailed)	.	0.000	0.000
	Second Choice of Health Website	Correlation Coefficient (r)	0.861(**)	1.000	0.912(**)
		Sig. (2-tailed)	0.000	.	0.000
	Third Choice of health website	Correlation Coefficient (r)	0.886(**)	0.912(**)	1.000
		Sig. (2-tailed)	.000	.000	.
		N	307	307	307

** Correlation is significant at the 0.01 level (2-tailed).

4.1.6. Association between Perceived Credibility and Reliability of Online Sources

The purpose of this question has been to explore an association, if any, between the sources of online and their level of perceived credibility and reliability. Perceived credibility and reliability of health information has been measured, and then subjected to factor analysis which yielded 2 scales; credibility of online sources, peer-network influence on online source credibility. The choices with the top two highest frequencies for the first, second and third choice of websites along with the perceived credibility and reliability scales is subjected to correlation tests (see above table 4.13). A significant positive correlation was obtained among them with ($r=0.912$, $p \leq 0.001$) for the second and third choice of websites and credibility of online sources scale, followed by positive correlation with ($r=0.861$, $p<=0.001$), the choice first and second of website finally followed by ($r=0.886$, $p<=0.001$) for credibility of online sources (see above table 4.13).

4.1.7. The Respondents Satisfaction in Use of Internet as a Tool

Results indicated using cross-tabulation in table 4.14 below, along with the Chi-square (x^2) value and the level of significance for a two-tailed test. There is a significant relationship between health professionals who have subscribed E-mail and satisfied with use of e-mail subscription in internet as tool of health information with $\chi 2 = 12.26$, df = 4, p = 0.0016. Data in the table 4.13 also has been shown that a majority of healthcare professionals who access and use internet as tool for healthcare information provision.

Table 4.14: Respondents who are satisfied from use of Internet as a Tool with E-mail list Subscription

Respondents Satisfaction in Internet as Tools			E-mail list subscription		Total
			YES	NO	
I am satisfied with use of internet as tools for health information	Strongly Agree	Count	159	8	167
		Expected Count	152.9	14.1	167.0
	Agree	Count	99	18	117
		Expected Count	107.1	9.9	117.0
	Don't Agree	Count	9	0	9
		Expected Counts	8.2	.8	9.0
	Disagree	Count	7	0	7
		Expected Count	6.4	.6	7.0
	Strongly Disagree	Count	7	0	7
		Expected Count	6.4	.6	7.0
Total		Count	281	26	307
		Expected Count	281.0	26.0	307.0

Chi-square ($\chi 2$) = 12.26, df = 4, p = .0016

4.1.8. Access to Online Health Information and Get Support in Similar Health contexts

Table 4.15 summarizes that that access to online health information with support or advice to other healthcare professionals in similar situation from healthcare professionals are related with ($p<=0.01$), from 307 respondents that strongly agree (89) to get support, agree response (173), don't agree (45).

Table 4.15: Get Support and Advice to other People in Similar Health Contexts from Online Health Professionals

		Access to Health Information Per Day			Total
		less than two hours	two to four hours	four to six hours	
get support and advice from other healthcare professionals in similar health contexts from online communities	Strongly Agree	66	23	0	89
	Agree	94	72	7	173
	Don't Agree	-	33	12	45
Total		160	128	19	307

As presented in figure 2 below that respondents select online information mostly with (44.5%) for site on prevention and cures, followed by site on prescription with (22.6%), site on support group with (16.2%) and site on education , promotion and others with (14.96%) respectively (see figure 2).

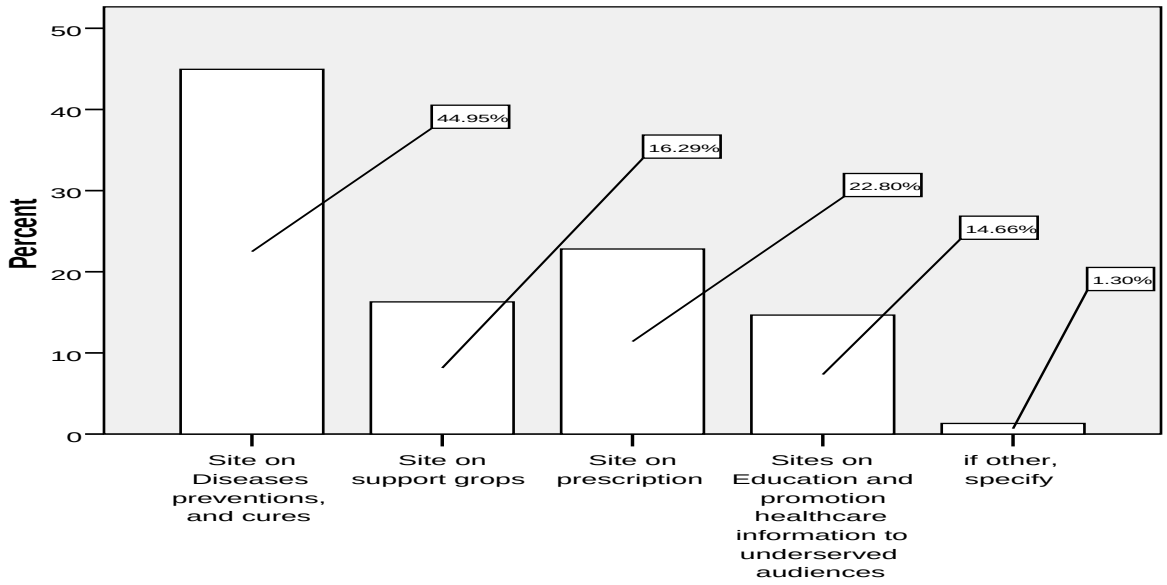

Fig 2: Preferable online health care provision

4.1.9. Prediction Power of Access to Online Health Information

This is modeled using multiple linear regression analysis, which was used to determine the predictive power of empowerment, online social networking, cognitive involvement with pertinent health information, and age variables on access to online information. The final set of predictor variables was chosen using the backward elimination method, and consisted of empowerment, online social networking, cognitive involvement with pertinent health information, and age. In the table 4.16, the results identified that all predictors are significantly (positively) correlated except age within dependent variable of access to online health information. The correlation coefficient between the observed value and the expected value with multiple regression (R) is 0.207 and the R square value suggests that 9.3% variability in the dependent variable of 'access to online health information' is explained by the four independent variables independent/predictor variables (Empowerment, Online Social Networking, Cognitive Involvement with pertinent health Information, and age variables).

The estimated multiple linear regression line is: $\hat{Y} = 0.676 + 0.039x1 + 0.028x2 + 0.025x3 – 0.007x4$, Where $\hat{Y}$ =predicted value of access to online health information, x1 = Empowerment, X2 = Online Social Networking, x3 = Cognitive Involvement with Pertinent Health Information and x4 = age (See table 4.16 below).

Table 4.16: Regression Coefficients for predictors and Access to online Health Information

Predictors	Unstandardized Coefficients		Sig.
	B	Standard error	
Constants	0.676	1.204	0.0009
Empowerment	0.039	0.053	0.0008
Online Social Networking	0.028	0.062	0.0002
Cognitive Involvement with Pertinent Health Information	0.025	0.051	0.0001
Age	– 0.007	0.089	0.0000

R=0.207, R square=9.281%

4.1.10. Access to Online Health Information predicted by Other Independent Variables

The result stated that access to online health information will be predicted by other independent variables such as ease of information seeking, getting preventive healthcare tests, Self-health Management & Privacy, and positive outcomes related to networking and learning. It was modeled using multiple linear regression analysis to determine the predictive power of independent variable among survey respondents. The final set of predictors were chosen using the backward elimination method and they are positively associated (see table 4.17). Similarly, the multiple linear regression coefficients between the observed value and the expected value are R (0.289) and ($p \leq 0.001$). This is a moderately high value which indicates that the linear regression model predicts well. The R square value suggests that 34.7% variability in the dependent variable of access to online health information is explained by the independent variables. The estimated multiple linear regression line is $\hat{Y} = 5.187 + 0.182x1 + 0.346x2 + 0.021x3 + 0.495x4$, where $\hat{Y}$ = predicted value of access to online health information, x1 = ease of information seeking, x2 = getting preventive healthcare tests, x3 =

Self-health Management & Privacy and x4 = positive outcomes related to networking and learning (see table 4.17 below).

Table 4.17: Regression Coefficients by other predictors and Access to Online Health Information

Predictors	Unstandardized Coefficients		Sig
	B	Standard error	
Constants	5.187	2.204	0.0007
Ease of information seeking	0.182	0.043	0.0009
getting preventive healthcare tests	0.346	0.062	0.0005
Self-health Management & Privacy	0.021	0.071	0.0001
positive outcomes related to networking and learning	0.495	0.048	0.0001

R=0.289 and R^2=34.7%

4.1.11. Challenges Faced when Searching for Online Information

As it indicated in table 4.18, 98 (31.9%) of respondents pointed out that too much information is retrieved, 84 (27.4%) of the respondents indicated that using online resources often confuses from work, 54 (17.1%) of the respondents indicated that limited access to internet connection and 71 (23.1%) of the respondents indicated that in other ways.

Table 4.18: Challenges faced when searching for online information

Online Information Challenge	Frequency	Percent
Too much information is retrieved	98	31.9
using online resources often confuses from work	84	27.4
limited access to internet connection	54	17.6
if others, specify	71	23.1
Total	307	100.0

4.2. Discussion

4.2.1. Socio-Demographic Information

Over half of the respondents (50.8%) access to online health information for less than two hours and another (41.7%) access to online information between two and four hours per day, this shows that the seeking behavior of respondents are significant in online. The results also stated that age group of (25-35) with bachelor degree respondents are mostly participated in this study and their online information seeking behavior in this group is higher than other groups (see section 4.1.1). Also the study identified the gender distribution, female respondents more than male respondents. Likewise, a previous study by Yoo mail survey (2004) indicated a more balanced distribution of education with a bachelor's degree were comparable in number, while those with a graduate degree were very much under-represented in "factors affecting middle-aged women's health information seeking on the web".

4.2.2. Behavior of the Respondents to Use the Internet

4.2.2.1 Accessibility and Category of Internet

The researcher conducted to ensure the problem of internet availability for health professionals. The results (in section 4.1.2.1) revealed that the internet availability in hospital and home computers is the most preferable to browse online health information in order to facilitate health care provision. This may possibly mean that the increasing accessibility of connected internet computers in both hospital and home is likely to encourage their seeking behavior of healthcare information retrieval and dissemination. Therefore, health professionals in each hospital using of broadband internet is highly appreciated than other category of internet to retrieve and disseminate health information remotely. However, a study was conducted by Etsub (2009) about "physicians' culture of use of online medical evidence" and one of the barriers to internet usage was computer room crowd ness and a few internet connections among computers in hospital settings.

4.2.2.2. Accessibilities of E-mail Subscriptions

E-mail subscription is one of the services that facilitate communication in healthcare provision. Result in this study (91.5%) of e-mail subscription is higher than the study that was conducted in Addis Ababa by Etsub's (2009) (42%). The e-mail has become the common

reason to internet usage. Therefore, the study identified that e-mail subscription is one of the online information usage. Thus, E-mail subscription helps to retrieve and disseminate information by using it as network tools. Similar study was identified that the about accessibilities, one of the most important ways to internet is telecommunication infrastructure availabilities.

4.2.2.3. Healthcare provision using of Online Information

Problems related with in search of online information with regard to skills, motivations, availabilities, dissemination and retrieval issues are main considerable facts in healthcare provisions. Accordingly, using of composite scores have been created for each of the factors, the mean and variation (standard deviations) of the item scale results which had their primary loadings on each factor. The respondents also refer greater use of the online seeking behavior strategy by selecting lower composite score. From the result depicts that the confidence of respondents in messaging and retrieving online information for healthcare provision rated as first rank with mean score of (1.48). The same way peer-network influence on online source credibility with mean score of 1.52 has been used considerably as second most important for online information seeking. The mean scores for factors indicated a moderately high degree of gratifications sought with ease of information seeking factor having the highest rank next to peer-network influence on online source credibility followed by the empowerment factor, Self-health Management obtained the lowest rank. (See section 4.1.3.6)

Likewise, online social networking like YouTube, Facebook, Skype, Twitter, etc. emerge as a strong motivation for the respondents as is evident in order to discuss in similar concern either in text or audio-video systems. Although self-health management & privacy items have highest mean value which indicated that respondents faced security problems to transfer information. Similar study by PhiliP et al (2009) identified that a unique characteristic of online information as a medium that frequently offer or seek advice from other healthcare professionals in similar contexts or situations on similar health concerns. While, these results indicate that respondents look for online social network information because it is convenient.

4.2.3. Gratification Sought in Access to Online for Health Care Provision

The result states that in cross tabulations are more likely to satisfy with use of internet as tools for health information if they have subscribed on e-mail. Based upon the results indicated that there is a significant relationship between respondents who have subscribed e-mail and satisfied with use internet as tool of health information, $\chi 2 = 12.26$, df = 4, p = 0.0016. Data was resulted that a majority of respondents who access and use internet as tool for healthcare information (see section 4.1.8). With regard to this, the responses collected from the scale revealed that ease of information seeking is a powerful motivator for health professionals to access online health information, as is the empowerment they feel about dealing with their healthcare provision (Luo et al., 2011). Respondents also indicated that they accessed online health information for the privacy it offered and the self-health management aspect. Therefore, online information is important motivator that revealed as the ability to communicate in a network media with other members of the online health professionals. Likewise, the results specified that the health professionals to use internet in order to give and take consultancy services in healthcare information as whose situations may be very remote (Lagan et al, 2011).

4.2.4. The Relationship between Access to Online Health Information and Behavior Modifications

Ayers and Kronenfeld (2007) stated that the relationship between online health information and behavior modifications should be better examined. Since one of the goals of communicating information and raising awareness is that respondents change unfavorable behavior into favorable behavior in order to disseminate healthcare information. A similar study conducted by Leung (2008) stated that using correlation and hierarchical regression found that "behavior or behavioral intentions in health information seeking was definitely a function of value expectancy or an evaluation of health information websites" and that "subjects who score high on expectancy value/quality of online health information are positively and significantly linked to accessing online health information". Likewise, the results in the finding of this study also suggested that there is a significant relationship between accesses to online health information and behavioral modification (got additional healthcare tests relevant to healthcare provision, got additional related tests relevance). Hence,

the online information seeking among health professionals in this study is positively correlated for disease prevention rather than medical attention.

4.2.5. Access to Online Health Websites

Websites that frequently visited by respondents. The data was revealed in this study based on results using bivariate correlation that the following categories of health websites: social online websites, hospital websites, pharmacy websites, insurance websites, general health websites, search engines, (WebMD, PubMed, HINARI, and Medline) and other websites. There is a powerful tendency to choose WebMD, PubMed, HINARI and Medline as the first choice of websites, followed by general health websites, search engine and insurance websites respectively as top three possibilities as the second choice of websites. Search engines, general health websites and hospital website are the top 3 of third choice for health professionals. The study prefers that the choice second and third choice of website more significantly than others choices in order to provide online health care information services (see section 4.1.6).

Hence, the survey in pew internet usage (2013) was confirmed that "46% of online health professionals agreed that the information they found online led them to think they needed for medical attention." However, a study by Marton (2011) identified that the websites sources preferred for prevention support rather than medical treatment due its "complexities, information overloading, poor information quality, potential harm and lack of scientific evaluation."

4.2.6. The Association between Choice of Websites and Credibility of Online Sources

The study also found in the results that the association between choice of websites and credibility of online sources has revealed a significant positive correlation specially the uppermost two sources of the first choice of websites (WebMD, PubMed, HINARI and Search Engines) and both credibility of online sources and peer-network influence on online source credibility scales. These indicated that the respondents have significantly associated to choose bibliographic health database (WebMD, PubMed and HINARI) for its high level of trustworthiness requirements, credibility of online sources and peer-network influence on

online source credibility. The association is verified by bivariate correlation (see section 4.1.6 and 4.1.7 above). Based on the findings, the study identifies that the respondents give attention highly to bibliographic database source (WebMD, PubMed, HINARI and Search Engines) rather than other locally developed web contents.

The facts that in the result identified online seeking behavior of respondents in the health management & privacy, information seeking from experts and confidence in internet navigation & file sharing could possibly be sufficient justification for health care institution to plan on job online training for health professionals. However, their online seeking behavior mostly in health care provision, getting preventive healthcare tests, ease of information seeking, confidence in messaging and retrieving information, cognitive involvement related with pertinent health information, all outcome expectancy scales and peer-network influence on online source credibility are moderately applicable (see section 4.1.3.6). In addition to this, studies were conducted by Cho, H. C., & Lee, J. S. (2008) and Marton (2011) on web survey dissertation indicated that health websites received fairly high ratings for perceived information source and it is relevant to satisfy healthcare information transmissions. However, the study was identified by Hu and Sundar (2010) that the online information needs trained health professional better to evaluate health information and build confidence in privacy and security.

4.2.7. Prediction Power of Online Access to Health Information and other Independent Variables

The results indicated that the predicted value for access to online health information increases by 0.182, 0.346, 0.012 and 0.495 units for every 1 unit increase in ease of information seeking, getting preventive healthcare tests, Self-health Management & Privacy, and positive outcomes related to networking and learning. So that these predictors indicated that access to online health information created the main health care information retrieval and dissemination to the respondents in each hospital. From this the study identifies that online information seeking of respondents mostly applicable for network services and prevention (section 4.1.10). Likewise, the predicted value of access to online health information increases by 0.039, 0.028 and 0.025 units for 1 unit increase in the scales of empowerment, online social networking and cognitive involvement with related health information respectively, and

decreases by 0.007 units for 1 unit increases in the scale of age (section 4.1.10). Similar study was conducted by Dolan et al (2004) in primary health care services through accessing online above 51%, it was approved that online is the most preferable sources with invers relation of age. Correspondingly, related study by Hardey (2001); Bruce and Sarah (2009) conducted about social media implementation processes in accessing online information in healthcare were positively reflected for successfully cost effectiveness and ease of health information through fast information transmission. This may reflect the fact that the can transfer health information easily.

4.3. Limitation of the Study and Area of Future Work

This research thesis examined the role of several variables in determining the access and use of online health information among health professionals. The findings suggested that in research questions should be considered investigative as results of statistical tests were significant but most of the Cronbache's alpha levels and predictors were relatively low. For future research, these variables should be studied on their own, in greater depth and with greater focus. Since there has been limited time and resources, this study conducted as part of cross-sectional study focusing only internet sources rather than other online sources.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

Generally, health professionals are rapidly being reformed by the improvement of online information into conventional healthcare provision. Relatively high levels of seeking and use are recorded for the various online health information sources. The findings suggested that health professionals fulfill certain needs and are generally considered to provide genuine benefits especially in disease prevention. Health professionals from selected hospitals verified a reasonably high level of seeking and use of online facilities. However, it is clear from the results, health professionals said that they benefited from the ease of access by internet resources, and there is also a corresponding lack of critical evaluation. According to the findings of this study, the health professionals are generally good in online skills, with no marked negative changes towards online information seeking.

Health professionals' online information needs are shown to be diverse, although the online is mainly associated to health information to disseminate and retrieve information. Respondents expressed strongly desire to use internet bibliographic databases. There have been a number of significant barriers to the identified uses. When asked about the changes that they might like to see, support for greater access and training have been cited. Among the main findings of the study were the followings:

- **Access**: computer laboratories are available at both private and public institutions including main computer laboratories. Although facilities for online access are available, they do not seem to sufficiently provide for each health professional at the selected hospitals.
- **Connectivity and connection types**: most of the respondents gained access to the internet by means of broadband and dial up computer laboratories. The connection types that seemed to dominate broad band access rather than other connection types, although a few of the respondents did not know the type of connection they had.
- **Satisfaction with mode of internet provider:** most of the respondents are not satisfied with monopolized internet provision systems to access information. They

complained about poor internet connections, arguing that they mostly failed or were down.

- **Responses to address challenges of internet use**: most respondents said that they use internet in their search for health care information. Significant growth has been recorded in the use of the online information although online information has still remained important. Most respondents need intensive online information training for rising of online seeking skill gap.

5.2. Recommendation

5.2.1. Recommendations to Government and private Hospitals

On the whole, the hospitals of Ethiopia based on respondents should provide comprehensive training programs that address the skills deficiencies noted in health professionals. It is also necessary for mechanisms to be introduced that improve both physical and knowledgeable access to online information resources. The following recommendations are based on the finding of the study.

- Purchase ICT infrastructure (e.g. computer laboratories, UPS, Generators, etc.) to ease up overcrowding.
- New and more creative connectivity types offering greater mobility and ease of access, such as wireless technology, need to be instituted (this could expand internet access to each hospital and residence).
- Increasing of bandwidths should be increased for fast internet speed with reducing the cost of it.
- Online information training - infrastructural investments should be followed up by training to impart high end information seeking skills on all members of health professionals in hospitals. There should also be a greater emphasis on information literacy to shape health professionals into responsible users who are concerned about the value of the information they use. ICT skills are the foundation of effective online information seeking policies.
- Health institutions in their own rights should invite more locally understandable web page designers to disseminate and retrieve healthcare information sources by making internet connections availability for example by making computer accessibility to

connect internet easily (preferably settings up wireless internet, broadband internet) in the premises of hospitals to healthcare professionals at point of healthcare provisions.

- Similarly, overall behavioral change in using of online social network availability also vital components across health institution. The development of a universal information flow would be ideal, presenting current evidence of the study results, health institution and ICT facilities should try to prepare the following advices to modify their online information seeking behavior (Bruce and Sarah, 2009).

Guidelines should include:

- ✓ goals should include accessibilities and resources which are available in up-to-date health care provision through social media usage
- ✓ strategies, policies and procedures regulating legal and illegal use of social network media, including instructions highly recommended

5.2.2. Recommendations for Further Research and Policy Issues

- The impact of online information on healthcare and its impact in the Ethiopian hospitals have yet to be determined. The relationship between the use of online technology and healthcare reforms continues to be one that inspires an enormous quantity of research. This study has focused on the online information seeking behaviour of health professionals at hospitals in Addis Ababa, Ethiopia. Further research could extend the criteria of the study and explore how health care professionals from other hospitals and health institutions behave online in their endeavours to meet their information needs. The study population in later studies could also be widened to get clearer indications of the online information seeking behaviour of health professionals based on their levels of healthcare provisional associations.
- For internet service providers' facility, the monopolized systems of Ethiopian internet service provider should be expanded with other competing organization in order to facilitate online needs with increasing of bandwidth, speed, and services and to reduce the internet connection problems and costs. Therefore, its implication for policy makers such as FMOH, ICT Agency, etc. to communicate and reorganize the systems of internet service provision in addition to Ethiopian Telecom organization in order to

facilitate overall internet or online information in each hospital setting and other health institution.

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Appendix A

Self-Administered Survey Questionnaire to "online information seeking behavior of health professionals: the cross sectional study of Hospitals in Addis Ababa, Ethiopia"

Dear Respondent,

My name is _____, I am working with Degale Desta who is currently a post graduate student in Addis Ababa, University in Department of Health Informatics. Generally, the study is seeking your help in a survey on the analysis of the online information seeking behavior of health professionals.

The main purpose of this study is to identify the behavior of online information or internet use of health professionals for provision of health care in Addis Ababa Hospitals and to understand their information-seeking behaviors.

The result is entirely used for academic purpose. To save your precious time, the study presented most of the questions with the possible answers. Please choose **one or more** answer which best explains your situation by putting "X" mark in the corresponding box, or write your answer in the space provided for each question.

Your precious effort in completing this survey is greatly appreciated.

Name of Hospital_____Occupation _____Date_____

Thank you in advance!!

Contact Address: Mr. Degale Desta , Mob: (251)-9 13114266
E-mail: degale2009@yahoo.com
Addis Ababa University
Department of Health Informatics

Section I: Socio demographic characteristics of health professional

No	Questions	Response
1	Sex of respondent	Male Female
2	How old are you?	_____
3	Field of study	_____
3	Education level	Bachelor Degree Medical Doctor Master degree Doctor of philosophy (Ph.D) If other specialty, specify _____

1. Do you have internet connection in your hospital? YES ☐ NO ☐
2. If your answer in above #1 is NO, Where do you go to get online information? (Check all that apply):

   At youth service agency; ☐ Friend or associate's house; ☐

   At home, where you are staying; ☐ Internet café; ☐

   Mobile phone ☐ others, please specify _____

3. Have you ever been searched the internet to look for online healthcare information sources? Yes ☐ No ☐
4. What kind of healthcare information sources did you use to search for healthcare information?

   Bibliographic database such as Pub Med, Medline, etc. ☐ Free search engine like Google ☐

   Both Bibliographic and Free engine ☐ others, please specify _____

5. Which bibliographic database did you search? Multiple answers are possible

   Pub Med ☐ MEDLINE ☐ CHINA ☐ I don't remember ☐ other please specify

6. How do you rate your efficiency in searching online information for health care?

   Very good ☐ Good ☐ Poor ☐

7. As a professional, in which area of healthcare provision mostly you prefer online information?

sites on diseases, prevention, and cures ☐ sites on nutrition ☐

sites on prescription drugs ☐ Site on support groups ☐

Sites on education and promotion of healthcare to underserved audiences ☐

If others, please specify _____

8. Please indicate that the average amount of time for healthcare provision, you spent on the online per day?

Less than an hour ☐ Two to four hours ☐ Four to six hours ☐

More than six hours ☐ if other, please specify _____

9. Which of the following Internet connection types do you use?

Dial-Up/ regulator modem connection ☐ Broadband connection ☐

I don't know ☐ other, specify……

Section II: Use of Online Health Information Items

A five-point scale was used that consisted of responses by putting: "Strongly Agree," "Agree," "Don't know/Can't say," "Disagree," and "Strongly disagree"

I would like....	Strongly agree (SA)	Agree (A)	Don't Know (DK)	Disagree (D)	Strongly Disagree (SD)
get information to better health and prevent health-related risks	1	2	3	4	5
spend time thinking about information I retrieve from the Internet before making health-related decisions					
get information that helps me understand better what I can and cannot handle on my own as far as healthcare is concerned					
discuss information I find online with healthcare provider					
frequently go back to the Internet for follow up information on health-related issues					
spend time determining the significance of online health information I get before making health-related decisions					
save/store/print health-related information					
Section III: Behaviour Modifications Items Based upon online health information I get and think about, I…					
got additional health-related tests relevant to my family history					
got additional health-related tests relevant to my demographic profile					
got additional health-related tests relevant to my personal needs					
got healthcare attention promptly when needed					
Section IV: Gratifications Sought Items I seek online health information because it allows me to…					
evaluate/assess information at my own pace					
comprehend information on my own time					
evaluate information on own time					
comprehend information at my own pace					
instantly retrieve information as and when I need it					
feel better prepared to discuss my health with my doctor/health care provider					
keep up with the developments in the field of healthcare					

supplement information I get from my co-worker/healthcare provider					
get a variety of information from different sources					
get fast dissemination and retrieval up to date healthcare information					
get a earliest online diagnosis through self- diagnostic applications on websites					
retrieve information secretly					
get information in the privacy					
…adjusting assistance remotely for un served rural areas as distance consultation for healthcare provision					
get support help and advice from other healthcare professionals in similar health contexts from online communities					
get viewpoints of healthcare professionals in similar health contexts/illnesses					
offer support help and advice to other healthcare professionals in similar situations					
Section V: Internet Self-efficacy scale					
I can comfortably send and receive e-mail messages					
I feel confident looking for specific information on the web/online information					
I feel confident looking for general information on the online					
I am confident gathering data and information on the Internet					
I am confident in sending and receiving information on the Internet					
I can describe words and terms related to the Internet					
I can understand terms/words related to Internet software Ex web browser e-mail software like Mozilla, opera, internet explorer, etc					
I can comfortably download material from the Internet (for e.g. buy songs, pictures for private/academic use etc.)					
I understand what the Internet can or cannot be used for					
I can upload scanned pictures onto a private file-sharing website					
I can troubleshoot/maintain internet problems					
I turn to online groups for help when I need it					
I am comfortable learning advanced skills within specific Internet programs					
I can understand terms/words related to Internet hardware (for e.g. processors, memory, modem, wireless technology, etc.)					

I can scan pictures/documents to save on my computer					
I can use videoconference when it needed					
I can use health related databases site like PubMed, MEDLINE, HINARI, etc.					
Section VI: Involvement scale					
I pay attention to health information relevant for gender even when I do not have healthcare problems					
I trust on experts/ doctors advice rather than trusting on common sense in treating in myself					
I go to doctors to seek professional help rather than try to treat in myself on the web					
I familiar with using of search engine like Google, youtube, yahoo, skype ,etc for healthcare provision					
I have been learning how to treat some of health problems without contacting other healthcare professionals					
Instead of waiting for others to tell me I usually ask the doctor or other health professional in online immediately					
I usually ask the a lot of questions about the procedure during or before the medical exam					
I would rather have doctors/nurses make the best treatment decision for me rather than give me a whole lot of choices					
I'd rather be given many choices about what is best for healthcare provision					
I usually don't ask the doctor/nurse many questions about what they are doing during a medical examination					
I'd rather have doctors/nurses make the best treatment decision for me rather than give me a whole lot of choices					
I'd rather be given many choices about what is best for health care provision than to have a doctor make decisions for me					
Section VII: Outcome Expectancy scale					
I become overcome with information concerning health care provision					
Online health information is too complex to understand					
Understanding information was difficult with the large volume of information					
I am concerned about how online health information fits with specific healthcare provision					
I am concerned about how online health information					

fits with the specific healthcare provision of my family and other community					
I get concerned about trustworthiness of online information sources like facebook, youtube, skype, e-mail, etc.					
I am concerned that some information online is biased because it provides to decentralized interest of drug companies and others					
I get concerned about protection of privacy of health-related information using online					
I am satisfied with use of Internet as an information tool for health information					
I am satisfied with use of internet as a learning tool for health information					
I am satisfied with use of internet as a networking tool for health information					
Section VIII: Online Information Credibility and Reliability Scale					
If the website is sponsored by healthcare institution, I check the authorizations of the same					
I almost always check the author of the health website I visit					
I frequently check how a website is rated among online health communities					
I almost always check the About us section of the health website I visit					
I only visit websites belonging to reputed health organizations					
I recommend websites I find reliable to family and co-workers					
I visit websites recommended by my family and friends					
The information on websites I frequently visit is credible					
I do not care what credibility of the source is as long as the information makes common sense					
I rarely check websites sponsored by health organizations because of their biased interest					
I only visit websites recommended by doctor/healthcare provider					

1. What challenges did you face when searching for online information?

Too much information is retrieved ☐ Using online-resources often confuses from work ☐

Lack of IT knowledge and skills ☐ Limited access to computers ☐

Others, please specify _____

2. Suggest what can be done to address the challenges you have stated above.

Taking appropriate training about online ☐

Purchasing more ICT equipment ☐

Promoting its use with other co-workers ☐ others, please specify __

3. List three websites that you visit most frequently to obtain online health information. Rank the order with 1-being most frequently accessed, 2-second most frequently accessed and 3—third most frequently accessed website.

1) _____
2) _____
3) _____

Thank you very much for your helpful comments /suggestions and time.