FACTORS INFLUENCING HEALTH INFORMATION-SEEKING BEHAVIOR AMONG HEALTH CARE PROVIDERS IN TANGA REGION, TANZANIA: A CASE STUDY OF MUHEF PROJECT

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Damian G. Laki

A Dissertation Submitted in Partial Fulfilment of the Requirements for the Degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences

November, 2008

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for examination a dissertation entitled "***Factors Influencing Health Information-Seeking Behavior Among Health Care Providers in Tanga Region Tanzania: A Case Study of MuHEF Project***" Submitted in Partial Fulfilment of the Requirements for the Degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences.

Prof. G.I Msamanga
(Supervisor)

Date 15. 11. 2008

DECLARATION AND COPYRIGHT

I, **Damian Gadiye Laki**, declare solemnly that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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DEDICATION

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ABSTRACT

In Tanzania, health information-seeking behavior among health care providers is not yet fascinating enough to provide high quality health services. Little is known about problems that preempt health care providers to look for information, and how they integrate what they find into their actions, to improve both preventive and curative health services in Tanga Region. The aim of the study was to determine factors influencing health information-seeking behavior and utilization of ICT resources among health care providers in Tanga region. A cross sectional study was conducted in July 2008 among 202 health care providers in Tanga region. Questionnaires were administered to find out what types of health information are searched by health care providers and their sources. Of the 202 health care providers, 52% reported that they knew how to use a computer, 48% had access to a computer and 36% reported that they didn't have access to internet services. Providers who knew how to use a computer were more likely to have access to health information (OR = 43.3, 95% CI: 17.3, 111.6). Thirty six percent of the providers reported that they sought the information to update their knowledge about diseases and new health technologies. Sources of information most preferred included textbooks (34.1%), colleagues (28.8%) and mobile telephones (21.1%). Barriers to seeking health information included lack of skills to search health information (17%) and lack of reading culture (15%). Urban location of the health facility was found to be strongly associated with health care provider's health information-seeking behavior (OR =14.18; 95% CI: 1.96, 288.6). Health care providers located in urban areas were more likely to search health information and use it than those in rural areas. Previous training on how to search information was not associated with improved health information-seeking behavior. The study recommends that health care providers in both urban and rural health facilities should continuously be trained on how to search and use health information.

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CD ROM	Compact Disk Read Only Memory.
CI	Confidence Interval
DAS	District Administrative Secretary
E-HEALTH	Electronic Health
GTZ	German Technical Cooperation
HIV	Human Immunodeficiency Virus
ICT	Information and Communication Technology
KM	Kilometer
LAN	Local Area Network
MPH	Master of Public Health
MUHEF	Muhimbili University Health Exchange Forum
OR	Odds Ratio
PDA	Personal Digital Assistant
RAS	Regional Administrative Secretary
RMO	Regional Medical Officer
SPHSS	School of Public Health and Social Sciences
SPSS	Statistical Package for Social Sciences
TGPSH	Tanzania German Programme to Support Health
TSH	Tanzanian Shillings.
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization.
URL	Uniform Resource Locator
WHO	World Health Organization

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CHAPTER ONE

1.0 BACKGROUND.

Information-seeking behavior has been defined by Wilson as 'the totality of human behavior in relation to sources and channels of information, including both active and passive information-seeking and information use'.[1] Information-seeking behavior by health professionals embraces a pattern of information resource use, time spent searching, barriers to information searching and information searching skills.[2]

The development of knowledge among health care providers is dependent on continuing access to relevant, reliable information through effective cooperation and flow of information among all stakeholders involved in the provision and use of information.[3] Health care systems around the world are facing major challenges related to communicable diseases, chronic diseases, demographic changes, nursing shortages, medical accidents and rising costs.[4] Health care service in the rural areas where most of the communities live is abhorrently inadequate.[5]

WHO reported that the use of ICTs in health is not merely about technology, but a means to reach a series of desired outcomes, such as enabling health workers making better treatment decisions, hospitals providing higher quality and safer care, people making informed choices about their own health, governments becoming more responsive to health needs, national and local information systems supporting the

development of effective, efficient and equitable health systems, policy makers and the public aware being of the made health risks and people having better access to the information and knowledge they need for better health.[6]

Cost-effective methods are needed to identify and build key information skills for each professional group (nurse, doctor, researcher, librarian, and journal editor) - different groups will require different levels and types of skills basic training and continuing professional development should be tailored accordingly.[3]

Many of the practical frustrations encountered by participants in the health care system in Africa can be due to lack of accurate and timely access to health information. Many of the deaths in Africa could have been avoided and several of the problems faced by health professionals could have been overcome by adequate supply of information at hand when needed. Information and communication technologies could provide fast, efficient and cheap access to information leading to dramatic improvements in access to advice and care.[7]

ICT provides opportunities for individuals, medical professionals and health care providers at all levels to be able to, obtain information, communicate with professionals, and deliver first-line support especially where distance is a critical factor and promotion of preventive health programmes. [8] It is crucial that every member has access to the information resources that are made available to them so as to suffice their needs or those they serve.[9]

A study done among rural health care practitioners in Hawaii on the barriers hindering them from accessing health information identified the following barriers inadequate technological infrastructure, increasing demands without static support resources, high cost of online delivery, and lack of ability to consult with colleagues.[10]
Other barriers included lack of access to reliable power sources, absence of Internet connectivity, inability to procure computer equipment and appropriate software and inadequate technical support.[11]

The School of Public Health and Social Sciences (SPHSS), University of Dar-es-Salaam and the Tanzanian German Programme to Support Health (TGPSH) of German Technical Cooperation (GTZ) jointly identified the unmet information needs of healthcare providers at district level as well as those barriers mentioned above. They conducted a needs assessment survey in 2002 at the district and regional level using a structured questionnaire with the aim of identifying information needs of health workers in the districts.

Findings showed that, 85% of the respondents had access to computers and (36%) had access to internet and CD ROMs. Respondents reported that they had a very limited access to hard copies of journals such as the Africa Health (34.7%), British Medical Journal (15.8%) and The Lancet (10.5%).[7] When asked to mention their information needs, the majority wanted to gain access to the latest treatment guidelines (81.1%),

Health statistics abstracts (70.5%) and articles from the local experts (66.3%). In the process of establishing MuHEF, efforts were made to address these articulated needs.[7]

The Muhimbili University, Health Exchange Forum (MuHEF) was launched in October 2003 and it was made accessible through the following website URL:www.muhef.or.tz. The main objective of MUHEF has been to facilitate information sharing amongst health personnel at national, regional and district level, thus bridging the urban-rural information gap for better clinical practice. Given the problematic and limited access to the internet in parallel, a CD-Rom version was developed.[12]

The MuHEF project assumes a number of activities such as to conduct marketing, distribution of CD ROMS to all districts in every two or three quarter's per year providing a new, updated version of the CD. Other roles are to encourage active involvement and commitment of resource persons conduct regular meetings on MuHEF's progress as well as moderating an online Questions and Answers Facility from health staff working in the Districts and Regions of Tanzania via the website and provide a timely reply from Muhimbili and other local institutions.

The MuHEF compiled a database loaded with the latest policy, training and treatment guidelines and relevant health Statistics in Tanzania and provided summaries of health information relevant for the provision of health services in Tanzania. This database is regularly updated and made accessible on the internet and through CD ROM.[12]

1.1 Theoretical Framework

The theory of Reasoned Action will be used to understand the complexities in health information-seeking behavior among health care providers in Tanga region.

The theory of Reasoned Action is a versatile behavioral theoretical model.[13] It defines the links between beliefs, attitudes, norms, intentions, and behaviors of individuals. According to this model, a person's behavior is determined by his behavioral intention to perform it. This intention is itself determined by a person's attitude and his or her subjective norms towards the behavior. [13] If the outcome appears to be beneficial to the individual, he or she may then intend to or actually participate in a particular behavior. Also included in one's attitude towards a behavior is the concept of subjective norm.[14]

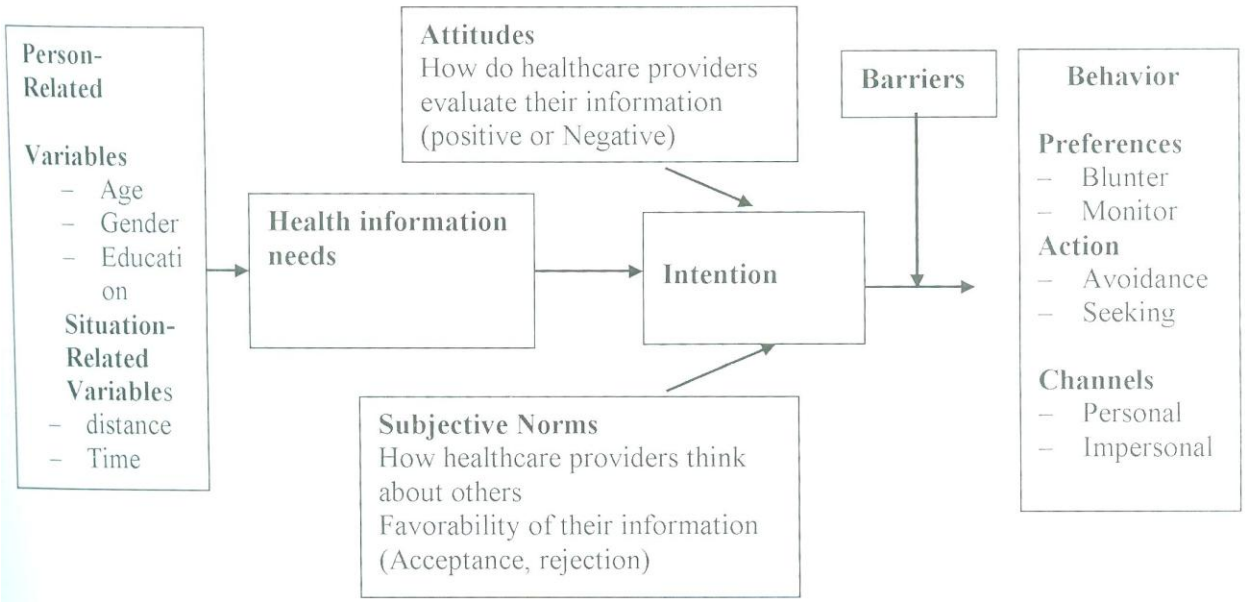


Fig. 1 Healthcare provider's health information-seeking behavior based on the extended model of the Theory of Reasoned Action.[14]

Source: Adapted from Understanding Attitudes and Predicting Human Behavior. [13]

1.1 General Overview on Information -Seeking behavior

A study done on health information needs and information-seeking behavior of rural health care workers stated that information seekers have both internal and external connections that are utilized through knowledge, skills, human resources, and non-human resources. [15] The authors also stated that having the latest technology may not be as critical as having sufficient time, training, and support and skills in using the resources at hand.[16] Also another study on modeling the information-seeking of professionals considered that information-seeking behavior of the health professionals are determined or affected by the characteristics of the information, awareness of the information and their potential sources.[17]

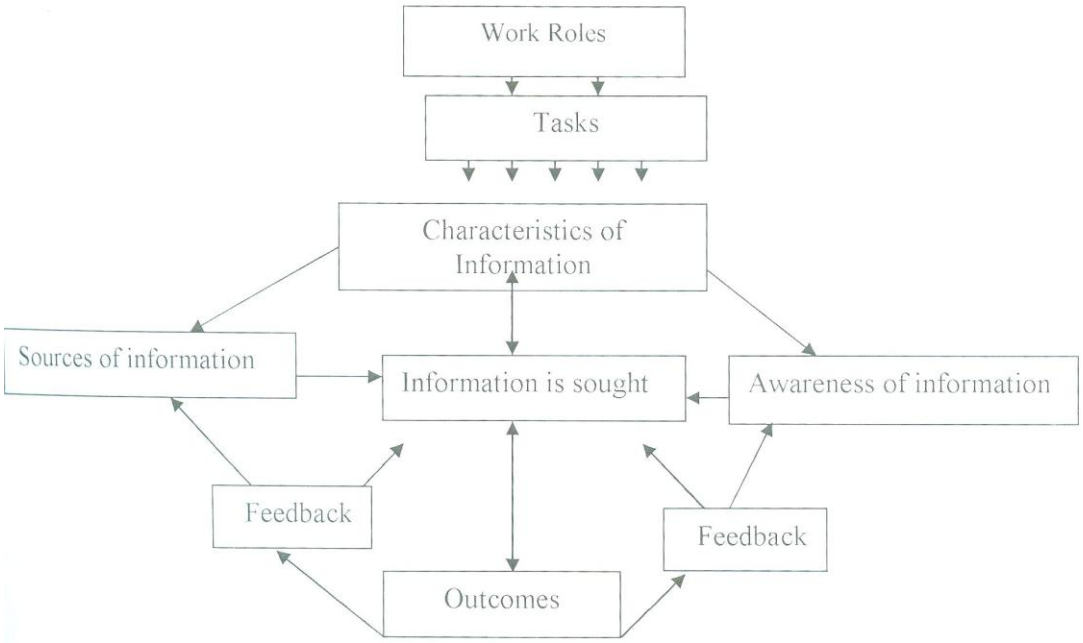


Fig. 2 A general model derived from research on engineers, health care professionals and lawyers.[17]

1.2 Digital Divides

The digital divide is the difference in people's inability or ability to access information through the internet and other information technologies and services due to geography, race, socio-economic status, gender and physical ability. The term is also used to describe the discrepancy between people who have access, knowledge, skills and ability to use the resources also the ability to use new information and communication tools, such as the internet, and people who do not.[18-20]

Tanzanian National ICT Policy stipulates that the gap between those who are able, and those who are unable, to participate in the knowledge economy is currently termed as the "digital divide." This digital divide is evident within nations, and between the developing and the developed world.[21]

1.3 The status of ICT in Tanzania.

Currently economic constraints, donor dependence and inadequate implementation of the National Health Policy, the country found itself flooded with technology of all kinds that was difficult to maintain. However the government has to put in place sound information systems, legislation and regulatory environment that encourages and supports effective development of an appropriate health care technology that is reliable and, operates continuously. [3]

The Tanzania Development Vision 2025 envisages a nation imbued with five broad issues among them being an attribute of the ICT Policy that articulates areas in which ICT should be harnessed in various departments as well as ensuring universal access to ICT facilities.[21]

Table 1 A set of key statistical indicators showing the major reform process, in 1993 and 2002.

Indicators	1961	1993	2002
Population (in millions)	12.3	26.7	34.5
Fixed line exchange capacity	11,300	125,703	234,640
Mobile phones operators		1	4
Mobile phones subscribers		1,500	700,000
Teledensity (lines per 100 people)	0.10	0.32	1.22
Data communications operators			16
Internet service providers		1	23
Internet subscribers (Dialup accounts and Wireless)		10	14,000
Internet capacity (total bandwidth Kbytes)		64	44,000
Television licenses		1	24
Radio broadcast licenses	1	2	18

Source: National Information and Communications Technologies Policy. March 2003.[21]

1.4 Problem Statement

Many ICT users in Tanzania had to access the Internet service through the internet cafés. There are presently 16 licensed Internet Service Providers (ISPs) in Tanzania that provide between 10,000 and 15,000 dial-up accounts in the country with many more users via Company and Government LANs and Internet cafés. Available e-readiness studies suggest that there is a large unsatisfied demand in the country for Internet access.[21]

A study conducted by UNDP, in collaboration with Dar es Salaam Institute of Technology and the Institute of African Affairs based in Hamburg Germany, showed that most of the ICT activities in Tanzania are concentrated in Dar es Salaam, and there is a little accessibility in other regions except in Mwanza, Moshi and Arusha, where ICT activities are beings stirred by the relatively high industrial development in those regions.[22]

Health information-seeking behavior among the health care providers in Tanzania is not yet fascinating enough to provide high quality health services even in the urban areas where there is more access to various ICT resources than in the rural settings. It is not yet well integrated in the health systems but rather used erratically and yield minimum improvement to those few institutions utilizing it.[19]

In rural areas where ICT facilities are erratically harnessed a situation obviously reflects that most of the information was sought from the health workers, since rural settings are faced by constraints related to poor physical and communication infrastructure,

dependence significantly on donor agencies for the provision of funds to rehabilitate infrastructure, alleviate poverty, and support the improvement of public health services. MuHEF project as a local initiative was established as a source for bridging health information acquisition gap between the rural and urban settings among service providers. When an evaluation study was conducted after two and half years from its inception. It showed that, of 131 respondents 93.9% reported to have access to a computer, 80.9% of the respondents had access to internet and half of the respondents (50.4%) mentioned that they were accessing internet at work, while 19% were not having access at all. Though health care providers at the district reported good access to ICT facilities, they were not fully utilizing the sources of information when providing health services. This is evident through underutilization of the "Ask Question and Discussion Forum" facilities on MuHEF website. [12]

However, little is known about problems that preempt health care providers to look for information, and we know less about how they integrate what they find into their actions. Currently they rarely utilize available and accessible health information resources at their working sites. These resources include local health information resources such as the MuHEF website and its CD- ROM facilitates as well as other national and international potential accessible online health resources.

Therefore study aims at identifying factors influencing health information-seeking behavior and utilization of ICT resources among healthcare providers in Tanga region to improve both preventive and curative health services.

1.5 Rationale of the study.

Given the costly investment on ICT, this study was designed to find out whether or not the intended users are actually utilizing the available health information sources at their working areas during the delivery of health services to their clients.

It was important to carry out this study so as to portray the factors influencing health care providers to seek health information and utilize the health information obtained in health services delivery and identify the areas in need of improvement.

The information collected in this study also scrutinizes whether or not access and application of health information from different sources, helps health workers to deliver services in a more improved manner.

Finally it paves the way for further studies on the application of ICT in enhancing telemedicine and tele-health centres for effective, life saving strategies and cost effectiveness, as well as time.

COLLEGE LIBRARY
MUHIMBILI UNIVERSITY
COLLEGE OF HEALTH SIENCIES

1.6 Broad objective

To identify factors influencing health information-seeking behavior among health care providers at the districts in Tanga region.

1.7 Specific objectives

1. To determine the percentage of the healthcare providers who have access to health information resources at the districts in Tanga region.
2. To identify the factors which influence health care providers to seek health information from various sources at their work place
3. To determine the proportion of healthcare providers with skills for searching health information in their districts.
4. To identify barriers or challenges faced by healthcare providers to seek health information from various sources during services provision to their clients/patients.
5. To identify the ICT facilities/sources that are mostly used by health care providers.

1.8 Research questions

What are the factors that influence health information-seeking behavior among health care providers in Tanga region?

1.9 Operational definitions.

Information is the result of processing, manipulating and organizing data in a way that adds to the knowledge of the receiver. In other words, it is the context in which data is taken.[23]

Information need refers to knowledge needed for the health professional to carry out patient care and professional duties.[24]

Information-seeking behavior has been defined by Wilson as 'the totality of human behavior in relation to sources and channels of information, including both active and passive information-seeking and information use.[1]

ICTs are defined as tools that facilitate communication and the processing and transmission of information by electronic means. This encompasses the full range of electronic digital and analog ICTs, from radio and television to telephones (fixed and mobile), computers, electronic-based media such as digital text and audio-video recording, and the Internet, but excludes the non-electronic technologies.[6]

Health care providers: Are all people whose main activities are aimed at enhancing health. They include: the people who provide health services -such as doctors, nurses, pharmacists, laboratory technicians and management and support workers such as financial officers, cooks, drivers and cleaners.[26]

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Health Information Needs

Few studies conducted on rural health professionals, information needs indicated that rural health practitioners appear to have the same basic needs for patient-care information as their urban counterparts, and that both groups rely on colleagues and personal libraries as their main sources of information.[24]

Health care providers need information about diseases, diagnostic procedures, treatment side effects and daily living activities. The demand for health information needs by health practitioners depends mainly on work roles and tasks they perform regularly.[14, 17] The most expressed need for information among health care providers is primarily to answer the client's questions. Majority of the health service providers are unaware of the knowledge gap that make librarians to decide for them or assume that health professionals only need information related to clinical work and not for other reasons. [2]

Another study conducted on nursing students and clinical nurses' information-seeking behavior mentioned that health care providers need health information depending on the nature and type of services they are providing.[27] For instance, majority of the population in developing countries live in rural areas, while the majority of the medical community

exists in the cities. In India, for example, 80% of the population is served by 20% of the doctors.[5]

Knowledge transfer to these areas has traditionally been difficult to achieve. ICTs, however, are increasingly being used to facilitate two-way information exchange in healthcare, providing isolated communities with access to the latest health information and treatment and informing officials of rural public health issues [5]

Effective utilization of health information facilities like the Internet and email, has helped to solve health problems in a short time for instance the use of Multipurpose Community Telecentres, in countries such Zimbabwe, Mali, Mozambique, South Africa, Uganda and Kenya in Africa under the support of UNESCO which facilitates the linkage of rural Africa with the rest of the world. Experiences with telecentres in Africa have not been highly encouraging but similar models in India and other countries have yielded positive results.[29]

On the other hand doctors in South Africa, through Dokoza mobile project which is established as a Centre for Public Service Innovation (South Africa), reported that they were capable to extract patient's data, medical history, diagnosis, health status and condition through a short message service (sms) and web based devices. Networks such as Cell life, the system enhances speed by fast tracking critical services to the national health care sector.[29]

2.2 Attitudes towards health information

Attitudes influence an individual on how to react or act towards utilization or avoidance of certain products or services. It guides an individual's behavior towards the services required and undergoes changes through personal experiences. For instance, health care providers have positive attitudes towards health information, in the sense that they use printed information from textbooks, journals, pamphlets, and pharmacological product inserts in hard copy.

Others use electronic or digital media, including online or electronic textbooks, databases, journals and web sites, and audiovisual materials, either personally owned or library owned; and some others rely on colleagues who are knowledgeable in a field of expertise via the telephone, in person, or through some electronic mechanism. [25,30]

Both patients and health care providers consider health information-seeking as positive behavior and valuable.[14] Also a study done on the attitudes of the health professionals towards information from internet and media, revealed that health care providers pay attention to information in the media, including the Internet, in order to stay abreast with any new health technologies because physician, are traditionally considered as the source of health information for various patient's problems. [33]

Information and Communication Technology increases the chances for the physicians to seek information and to be successful in conducting effective planning, decision-making

and monitoring, improved shared service operations more effective resource management to improve quality of health care. [31] Another study reported that physicians raise questions when dealing with a patient, but they pursue only a portion of it. Without the best information and evidence, care and patient's safety may be compromised. However understanding when and why problems, promptly influence health professionals to look for information and integrate results into their knowledge base is critical and it shapes one part of the reflection about care.[32]

2.3 Subjective norms regarding health information

Subjective norms concentrate on considering and compelling an individual to practice what others rejects or accepts as a behavior. It basically depends on both internal and external factors. The internal factors include aspects such as skills, abilities to obtain information, and emotions and stress while the external factors are determined by things like situations or environmental matters. This aspect is based on the function of beliefs that is, what others think are important to an individual.[30, 33, 34]

Health professionals believe that ICT can be used as a tool for collecting community health information to support decision-making. It is also a tool for improving doctors' access to current medical information; linking healthcare professionals to share information and knowledge; and for enhancing health administration, remote diagnostics, and distribution of medical supplies.[16]

Another study done on the subjective norms of both patients and their health professionals reported positive acceptance of health-seeking behavior. In general, health care provider's need the knowledge by searching from various sources in order to improve the quality of services they are providing to their patients.[14]

2.4 Barriers to Seeking Health Information

Previous studies mentioned barriers that hinder health care providers from seeking health information were pride, anxiety, resistance, and lack of skills or knowledge. Others include lack of time, long distances, bad weather, restrictive policies, and isolation. Sometimes some practitioners tend to rely on their own resources rather than seek outside information. However, lack of computers and inadequate Internet infrastructure, inadequate library access and databases, equipment, costs and space are among the reported barriers.[2, 15, 24]

A study conducted on information-seeking behavior identified that poor quality of health information from the source makes health professionals frequently fail to access information they need. However, their unfamiliarity with several important health information resources also contributes to such failures. This causes clinicians to choose the information sources that are most readily available, or those that are easily accessible and easy to use, so as to avoid complicated ways of searching health information from more dependable resources.[35]

However a study among rural health care workers on the Islands of Hawaii reported these barriers; inadequate technological infrastructure, increasing demands without static support resources, high cost of online delivery, and lack of ability to consult with colleagues. [10] Another study done on information-seeking behavior among health professionals identified the barriers encountered during the search of information includes that, answer does not exist, or there is too much information, or that the information is not sufficiently specific. When questions are pursued, answers may not be easy to find.[32]

2.5 Health information preferences

Another study on health information insights, suggests that the use of information and communication technologies (ICTs) and e-health (electronic health) applications, such as interactive websites, can be effective in helping people manage diseases, access health services and obtain assistance with behavior change.[37]

A study conducted in Hong Kong about information-seeking behavior among health professionals revealed that there is unequal use of health information among different groups of health professionals and confirmed that medical staff were most satisfied with the library collections and services. The nurses and hospital executives were found not satisfied, for they needed information not only for work-related reasons but also to support self-study and development.[38]

Several studies of physician's preferences for information resources have identified textbooks as one of the most important sources of information for patient care, and they are often a first choice for those seeking answers to clinical questions. However printed resources were found to be preferable to the same electronic resource and most of the doctors ranked 'humans' as their second choice.[39]

A study done on the roles of ICT in the health sector of developing countries concluded that, governments or agencies implementing ICT projects in the health sector should keep the technology simple, relevant and local, build on what is already there, involve users in the design of the system, strengthen capacity to use, work with and develop effective ICTs monitoring and evaluation as well as continuing to conduct research and share learning about what works, and what fails.[6] The experience of the Tanzania Essential Health Interventions Program (TEHIP) is perhaps the best source of evidence for the cost-effectiveness of improved health information.

There is however a slightly increased investment covered during training in use of the information to set priorities and manage the most cost-effective interventions. Management and technical support strengthened the district and regional health sector on the use of information for management and administration.[40]

2.6 Health information-seeking behavior

Service providers perceived that seeking information is imperative if one wants to provide high quality services. The information-seeking behavior is based on the context that forces a practitioner to seek it. Practitioners usually use knowledge, people and tools

in their settings so as to seek information.[16] Information-seeking behavior to some health care providers has some negative connotations in the sense that they think what they know is sufficient for doing the specific activities, and can only request information when they need it especially to solve the barriers.[14]

A recent study done on how primary health care physicians seek answers to clinical questions reported that, 83% of primary care physicians were able to find clinically useful information during their routine work, using the online evidence system and they were convinced of the potential of Quick Clinical to improve patient's care, and one in four users reported direct experience with improvement in the provision of care.[41]

Some other researchers concluded that the majority of rural professionals utilize conversations with their local peers as the primary means of information-seeking behavior, while other researchers concluded that researchers use materials from their own private collections. These collections may differ from textbooks to journal subscriptions.[16] Another study done among African-American community's health information-seeking behavior reported that 45% of all information the community needed originates from the health professionals and the other 14.5% of the community members reported that they get health information through the website, respectively.[28]

A study conducted on information needs in primary care, showed that the rural physicians used fewer sources than urban physicians, however the sources utilized

differed a little between these two groups, however such differences in urban and rural information-seeking behavior proved to be not of much significance.[42]

Another study done among primary care physicians on their information–seeking behavior explained that, the commonest source that was frequently used to provide an answer to the clients was a drug compendium, followed by a textbook, and colleagues.[39]

Also a study conducted on information-seeking behavior mentioned that physicians are increasingly successful and confident in their Internet searching to answer questions raised in patient care; few choose to seek medical information to solve patient's problems but most of them consult their colleagues.[32]

2.7 **Sources of information.**

In most cases the ICT resources such as textbooks, internet, PDAs, telephones, Facsimile, television and newspapers are applied. However the majority also use their colleagues as a source of information.[31, 43]

A recent survey done on the role of information in a lifetime process concluded that among general and social topics, the public including health professionals are mostly interested in receiving health information from different media channels. The results of the survey showed that the types of media that were contributing most to the public's health literacy are health magazines and health supplements of newspapers, closely followed by television and the Internet.[44]

The traditional technology such as the radio and modern technology such as the mobile telephone in many African countries are the most preferred in facilitating the dissemination of public health messages and disease prevention techniques in developing countries. The number of mobile subscribers exceeds those linked to the fixed net. For both the fixed-net telephone and the mobile phones, infrastructure and affordability are the main limiting factors of coverage.[45]

In a review done on information needs of rural health professionals, it was recommended that rural health care professionals need to have the required infrastructure in place to improve their online information-seeking behavior.[24]

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

This was a cross sectional study to identify factors influencing health information-seeking behavior among health care providers in district hospitals in Tanga region. The field work was done in July 2008 in Partial fulfillment of the requirements for the degree of Master of Public Health (MPH) of the Muhimbili University of Health and Allied Sciences.

3.2 Study area

Tanga region is situated at the extreme north-east corner of Tanzania between 4 and 6 degrees below the Equator and 37^0-$39^0$10'degrees, East of the Greenwich meridian. The region occupies an area of 27,348 sq kms, of which 48% of the area is occupied by Handeni district.Tanga region shares borders with Kenya to the north, Morogoro and Coast regions to the south, Kilimanjaro and Arusha regions to the west. To the east it is bordered by the Indian Ocean. Mligaji River also forms a large part of the border on the South.[46]

The region has an estimated total population of about 1,642,015 persons with a male population of 797,240 and female population of 844,775, respectively. [47] The region is divided into 8 districts including Lushoto, Korogwe, Muheza, Mkinga, Tanga, Pangani, Handeni and Kilindi. There are 9 councils namely Tanga city, Muheza, Mkinga,

Handeni, Kilindi, Korogwe, Pangani, Lushoto, and Korogwe city. This study involved 7 councils, with the exception of Kilindi and Korogwe city councils were not involved due to the fact that the two councils did not have district hospitals, hence depends on the nearby district hospitals such as Handeni and Korogwe take care of patients from both Kilindi and Korogwe city councils respectively.

Table 2 Distribution of Health Facilities in the Region, 1996

DISTRICT	TYPE OF HOSPITAL		DISPENSARIES	HEALTH CENTERS
	Public	Private (No.)	(No.)	(No.)
Lushoto	1	1	36	3
Korogwe	1	2	59	3
Muheza	1	-	51	2
Handeni	1	1	39	5
Tanga	1	3	63	3
Pangani	1	-	-	1
Mkinga	1	-	-	1
Total	6	7	248	17

Source: Regional Education Office, Tanga Region

This study was conducted in Tanga region, because it is among the region which receives MuHEF project's CD-ROM versions that were produced quarterly for the purpose of updating health workers with health related information at the district level. Tanga region was involved also in the evaluation survey which was conducted in 2006 for the purpose of assessing progress made by health workers, after receiving various versions of MuHEF Project's CD ROMs.

3.3 Study Population

The study population comprised of health care providers such as physicians, trained nurses, nurse officers, assistant medical officer, clinical officers, pharmacists, health secretaries and health officers working at the district hospitals in Tanga region.

3.4 Sample size determination

Since the major focus of the study was to identify factors influencing health information-seeking behaviour among health care providers, the sample size calculation was based on the estimated promotion of health care providers who seek health information

The sample size of study participants was computed using a formula borrowed from designing and conducting health systems research projects.[48]

$$n = \frac{Z^2 P (100-P)}{}$$

Where;

n = the required minimum sample size

Z = is the standard normal deviation corresponding to 95% confidence interval = 1.96

P = estimated proportion of the health care providers who seek health information was taken to be 64.0% This figure was obtained from a study conducted on "information-seeking behavior of nursing students and clinical nurses: implications for health sciences librarians" [27]

The assumption was based on the fact that the settings in both studies are not very different i.e. all are health professionals who perform similar tasks.

E = is the margin of error on P estimated to be 6%.

Hence;

$$n = \frac{1.96^2 * 64\ (100-64)}{6^2}$$

1.96 = the 95% confidence level at p =0.05.

Therefore $n = 1.96^2 \times 64\ (100 - 64)/6^2 = 246$. Having a total of 7 district councils in Tanga region, the minimum number drawn from each district council was calculated to be 35 obtained from (246/7) per district hospital.

3.5 Sampling procedure

On reaching the council district hospital at each district all health care providers were involved. Supportive staff was not involved in this study. All health care providers were covered in this study due to the fact that most of the district experiences serious shortage of the workforce. Though all health care providers were involved, the sample size expected for this study was not met. The coverage was 82% (202/246).

3.6 Data collection techniques

The researcher obtained permission to conduct the study from the Regional Administrative Secretary (RAS) and after he had explained the aim of the study. District Administrative Secretaries provided the permission to conduct a study by directing the researcher to the District Medical Officers of all districts. Appointments for data

collection were made in each district hospitals but the District Medical Officers were requested not to inform health care providers about the study as a precaution to prevent pre-informed answers. Structured interviews with open and closed ended options were used for Health care providers at the district hospitals.

Five research assistants were recruited and trained. The purpose of the training was to ensure that they understood the questions and it was meant to guide health care providers on how to fill in their responses. The data collectors passed from one office to another as directed by the in charge of the particular hospital. In most cases the district medical officer and district health secretary officers facilitated the, task. The researcher arranged the schedule for data collection in such a way that all of the health care providers in the particular hospital were included in the study. This was made possible by having the assistance of the district medical officers.

The following information was obtained through the questionnaire:

Information on whether they had access to a computer, internet services and usefulness of various sources of health information. Information on the barriers that hindered them from searching health information, factors that influence them to search health information and channels used in accessing health information.

3.7 Data processing and analysis

All questionnaires were assigned unique numbers accordingly. Open ended questions were coded before data entry. Data were entered, cleaned and analyzed using SPSS

3.7 Data processing and analysis

All questionnaires were assigned unique numbers accordingly. Open ended questions were coded before data entry. Data were entered, cleaned and analyzed using SPSS version 15.0. Data were presented using frequency distribution tables, graph, and pie charts. For the variables such as health information-seeking behavior and skills for searching health information cross tabulations were done with independent variables. Odds Ratios were used to examine the association between dependent variables (health information-seeking behavior and skills for searching health information) among health care providers and different independent variables. The significance level was set at $p<0.05$. During analysis, EPiInfo 2000 was used also to compute the Odds ratios and 95% confidence intervals.

3.8 Dependent and independent Variables

Independent variables:

Age, Education, place of work, Duration at work place, Gender and marital status.

Dependent variables:

Health information–seeking behavior, Training on how to use computer,

Skills for searching the information. The various sources of information consulted before attending a client.

3.9 Ethical Considerations.

The study was approved by the Research and Publications Committee of the Muhimbili University of Health and Allied Sciences. A letter of introduction to the Tanga Regional Administrative Secretary (RAS) was written by the School of Public Health and Social Sciences of Muhimbili University College of Health and Allied Sciences. Information regarding the study which was to be carried out in District's hospitals in Tanga region was provided and RAS was requested to give consent and the necessary support during the study period.

The RAS wrote a letter to District Administrative Secretaries (DAS) of all districts in Tanga region, who also wrote a letter of introduction to the District Medical Officers of their respective district hospitals, who in turn introduced the researcher to the health care providers, to allow the study to proceed. An informed verbal consent was obtained from the individuals/health care providers who were given the questionnaires to fill, after an adequate explanation of the purpose of the study, issues of confidentiality, freedom to participate, expected outcomes and the benefits of the study.

They were also assured that unauthorized persons will not be allowed to access the data collected from them. They were informed also that their responses would be used only for academic purposes, or helping to improving the services being provided by those facilities.

CHAPTER FOUR

4.0 RESULTS

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

A total of 202 health care providers in 7 district hospitals in Tanga region were involved in the study. The coverage was 82% (202/246). The health care providers were from Korogwe, 30(14.3%) Muheza, 29(13.8%) Mkinga 8(3.8%) Pangani 37(17.6%), Handeni 42(20.8%), Lushoto 26 (12.4%) and Tanga Municipality 30(14.3%).

Of the 202 respondents 140(69.8%) were married, 52.4% had a diploma level of education, 11.4% had university education, 11.9% college education and 18.1% had completed secondary education. The mean age of the respondents was 25.3 years, standard deviation (SD) ± 9.2 and the range was between 20 and 60 years and females were 88 (43.6%). Most of the respondents were from the government sector (85.1%) and the rest 14.9% were from Muheza designated district hospital that is under Faith Based Organization.

Table 3: Distribution of the respondents by socio-demographic characteristics and type of the health facilities.

Level of the Facility	Characteristics	Numbers	Percent
Districts	Tanga city	30	14.9
	Korogwe	30	14.9
	Muheza	29	14.4
	Mkinga	8	4.0
	Handeni	42	20.8
	Pangani	37	18.3
	Lushoto	26	12.9
Age group (years)	20-29	23	11.4
	30-39	82	40.6
	40-49	62	30.7
	≥50	35	17.3
Gender	Female	88	43.6
	Male	114	56.4
Marital status	Married	141	69.8
	Single1	48	23.8
	Ever married	13	6.4
Education level	Secondary and College	63	31.2
	Diploma and University	138	68.3
Religion	Traditional	3	1.5
	Muslim	61	30.2
	Christian	138	68.3
Place of work	Private facility	30	14.9
	Public facility	172	85.3
Duration of work in this hospital (Years)	0- 4	11	5.5
	5-9	61	30.6
	10- 14	51	25.5
	15-19	34	16.8
	20-24	17	8.7
	25+	26	12.9

5.2 HEALTH INFORMATION-SEEKING BEHAVIOR

Table 4 presents the health information-seeking behavior among health care providers. Fifty nine percent reported that they use the health information they had gathered from various sources only when necessary and 30.7% reported that they use the health information every time they run the services. Seventy four percent of the providers mentioned that they do consult health information sources several times and sometimes only once before rendering a service to the client.

About 75% of the health care providers stated that they inform their clients about what she/he had written in a prescription while 41(20.3%) reported that they do not, 36% reported that they do not have access to internet services, while 62.9% reported to have access to internet services. Twenty four percent of the respondents reported that they accessed internet services at the café which costs approximately 1000 Tanzanian shillings per hour. Sixty four percent of the health care providers reported that they do not know how to use a CD ROM while 32.2% of the providers reported that they knew how to use CD ROM. Of the 202 health care providers 106(52.5%) reported that they did not have skills to search for health information.

Thirty six percent of the health care providers reported that they had to travel a distance of less than 1Km before reaching health information resources. Other 11.4% reported that they had to travel a distance of more that 4Km, before reaching the health information sources.

Table 4. Access and knowledge on how to use computer and skills to search health information

Questions	Responses	Number	Percentages
Knowledge on how to use computer	yes	104	51.5
Access to functioning computer	yes	94	46.55
Access to internet services	yes	127	62.9
Differences in health information seeking behavior between health care providers located in urban against rural areas.	yes	152	75.2
Cost for accessing information at internet cafe per hour (TSh)	<1000	25	12.3
	>1000	65	32.3
Knowledge to use CD- ROM	Yes	65	32.2
Skills for searching health information	Yes	89	44.1
Distance traveled to reach health information sources (Kms)	< 1Km	72	35.7
	>1 Km	58	28.7

Table 5 presents the association between the access to a computer and knowledge on how to use a computer. The result shows that of the 202 health care providers, 104 (52%) reported that they knew how to use a computer. Of the 104, (18.3%) reported that they had no access to a functioning computer. These results show that providers who know how to use a computer were more likely to access health information compared with providers without computer knowledge respectively (OR = 43.3, 95% CI= 17.3, 111.6; P= 0.001).

Table 5. Association between Access to a functioning computer and knowledge on how to use a computer.

Access to a functioning computer					
Knowledge on how to use a computer	**Yes**	**No**	**Total**	**OR**	**95%CI**
Yes	85	19	104	43.3	17.32,111.63
No	9	87	98	1.0	
Total	94	106	202		

5.3 HEALTH INFORMATION PREFERENCES

Table 6 presents the preferred sources of health information and their usefulness.

Most of the health care providers (49.0%) reported that they consult their colleagues for health information. On the usefulness of health information accessed through other colleagues, 71.3% rated the information they get from colleagues to be useful or very useful.

Nearly 70% of the providers rated health information they obtain from textbooks to be useful or very useful. Other sources that were used according to preferences were the radio (33.2%), telephone/mobile (32.2%), textbooks/libraries (27.2%), television (22.8%), internet services (20.8%) and news papers (20.3%).

Other sources that were least preferred included Journals (12.9%), Drug representatives (11.9%), teleconference (6.4%), web database eg MuHEF website (5.4%) and Personal Digital Assistant (3.5%).

Table 6. Sources and usefulness of health information most preferred by health care providers

Health Information Sources	Very useful	Useful	Somehow useful	Not relevant	No response
General public (n = 185)	99 (49.0%)	45 (22.3%)	29(14.4%)	12(5.9%)	17 (8.4)
Textbooks /libraries (n = 185)	55(27.2%	86(42.6%)	29(14.4%)	15(7.4%)	17(8.4%)
MuHEF website (n = 123)	11(5.4%)	17(8.4%)	21(10.4%)	74(36.6%)	79(39.1%)
Internet services (n =151)	42(20.8%)	31(15.3%)	31(15.3%)	47(23.3%)	51(25.2)
Personal Digital Assistant (n = 121)	7 (3.5%)	16(7.9%)	18(8.9%)	80(39.6%)	81(40.1%)
News papers (n = 188)	41(20.3%)	81(40.1%)	55(27.2%)	11(5.4%)	14(6.9%)
Drug Representatives (n = 154)	24(11.9%)	44(21.8)	46(22.8)	40(19.8%)	48(23.8%)
Mobile cell phone (n = 174)	65(32.2%)	54(26.7%)	38(18.8%)	17(8.4%)	28(13.9%)
Television (n = 179)	46(22.8%)	77(38.1%)	41(20.3%)	15(7.4%)	23(11.4%)
Radio (n = 188)	67(33.2%)	78(38.6%)	34(16.8%)	9(4.5%)	14(6.9%)
Teleconference (n = 149)	13(6.4%)	46(22.8%)	33(16.3%)	57(28.2%)	53(26.2%)
Journals (n = 154)	26(12.9%)	38(18.8%)	40(19.8)	50(24.8%)	48(23.8%)

5.4 HEALTH INFORMATION NEEDS

Thirty five percent of the providers mentioned that they seek health information to update their knowledge about diseases and new health technologies. Other factors included the need to solve a specific problem of a patient (25%). Previous training and experiences in accessing the source and skills to search health information contributed 39% of the factors that influence health information-seeking behavior among the health care providers (Figure 1).

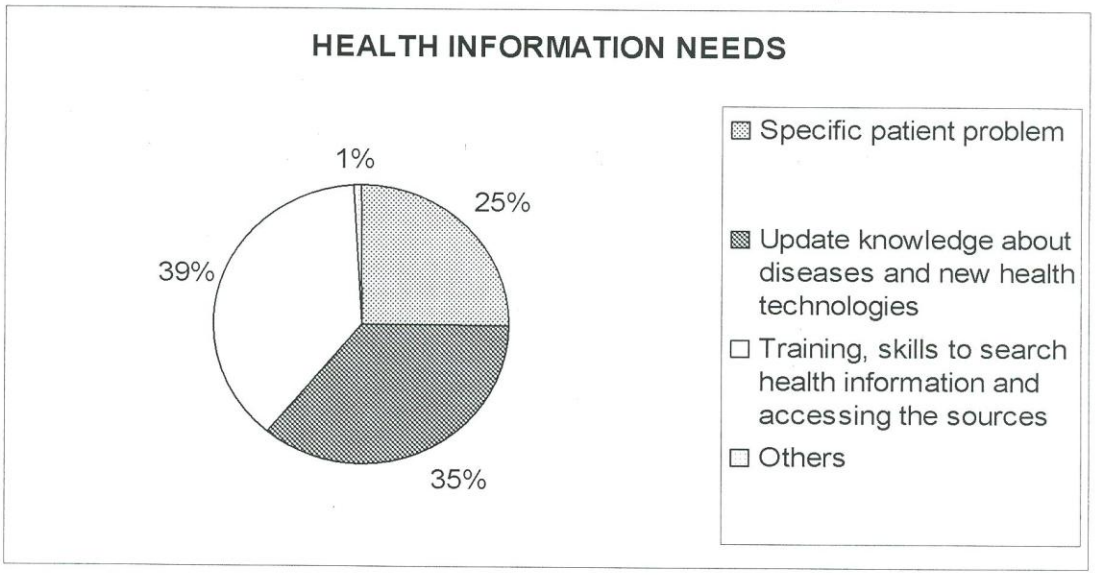


Figure 3. Factors that influence health care providers to seek health information from various sources.

5.5 USE OF SPECIFIC INFORMATION RESOURCES

Table 7 shows various sources of health information for health providers at work places. The commonest source of health information for health providers was textbooks (34.1%), followed by colleagues (28.8%), mobile telephones (21.1%) and internet (14.5%). MuHEF CD ROM was rarely used.

Table 7. Sources of health information for health providers at work places.

Sources of information	Number	Percent
Textbooks	155	34.1
Internet /web data base	66	14.5
MuHEF CD ROM	6	1.3
General public	131	28.8
Mobile phones/newspaper	96	21.1
Others	1	0.2
Total	455	100.0

5.6 BARRIERS TO SEEKING HEALTH INFORMATION

Figure 4 presents the barriers that hinder health care providers to access health information The barriers identified by health care providers included lack of skills to search the information (17%), lack of reading culture (15%) and lack of time (14%). Others were high cost together with unreliability of the sources (21%), motivation and hard work environment (15%). Inadequate access and poor distribution of ICT facilities (12%), long distance and restrictive policies (6%) were identified also as potential barriers.

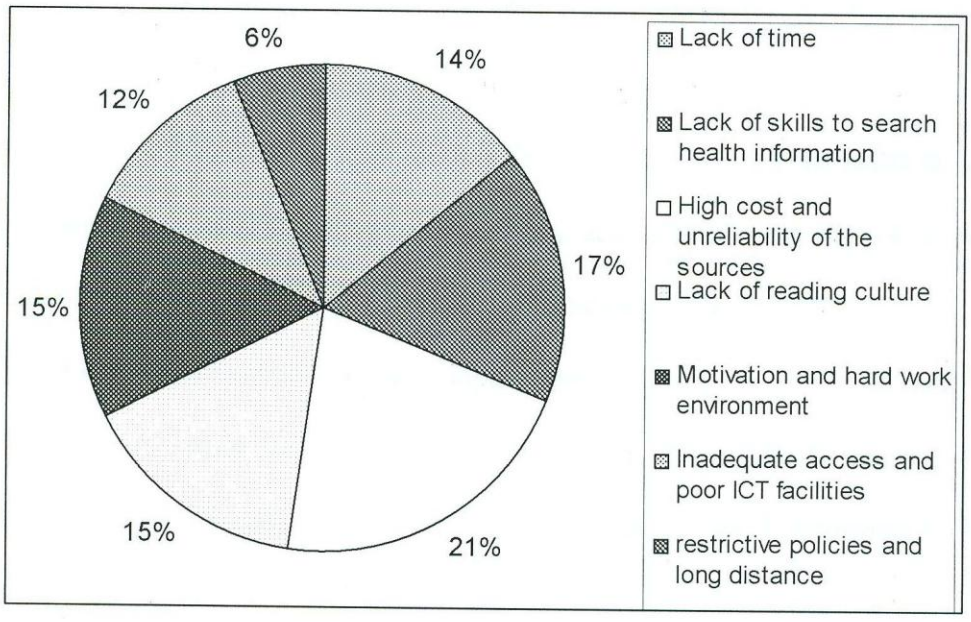


Figure 4. Barriers that hamper access to health information sources

5.7 Factors associated with providers' skills to search health information

Table 8 presents the factors associated with providers having skills to search health information.

Gender was marginally associated with individuals' skills on how to search health information. However, female providers were less likely to know how to search into than males (OR = 0.56, 95 CI: 0.3, 1.03) but the association was marginally significant.

Health care providers in the age group 20-39 years were 1.93 times more likely to have skills for searching health information than those who had age of 40- 59 years and the association was statistically significant (OR = 1.93, 95% CI:1.04,3.58).

Access to a computer was an important factor that influenced the skills to search health information. Of the 93 respondents who had access to a computer 68 reported to have skills on how to search health information (OR = 10.88; 95% CI: 5.29, 22.62).Knowledge on how to use computer was significantly associated with the skills to search health information. Those respondents who knew how to use computer were 13.1 times more likely to had skills on how to search health information. (OR = 13.1; 95% CI: 6.18, 28.19).

Table 8. Factors associated with provider's skills to search health information from various sources.

Factors	Skills for searching health information				
	Yes	No	Total	OR	CI (95%)
Gender				**Reference** (1.0)	
Female	31	52	83	1.0	
Male	58	54	112	0.56	0.30,1.03
Age group (yrs)					
20-39	54	47	101	1.93	1.04,3.58
40-59	34	57	91	1.0	
Type of the facility					
Private	7	23	30	1.0	
Public	82	83	165	0.31	0.11,0.81
Access to computer					
Yes	68	25	93	10.88	5.29,22.62
No	20	80	100	1.0	
Knowledge to use computer					
Yes	74	29	103	13.1	6.18,28.19
No	15	77	92	1.0	
Attended short course to search health information					
Yes	26	8	34	4.95	1.98,12.80
No	61	93	154	1.0	
Duration of service					
0- 19	87	73	160	2.52	1.16,5.54
20-49	13	29	42	1.0	
Location of the health facility					
Urban	38	22	60	2.84	1.45,5.62
Rural	51	84	135	1.0	

Thirty four of the respondents had attended short course on use of information and are 4.95 times more likely to had skills on how to search health information from various sources compared to providers who didn't attended the course on how to search health information (OR = 4.95; 95% CI: 1.98,12.80).

The findings showed that 160 of the providers had worked for 0-19 years. These were more likely to have skills to search health information compared with providers who had worked for 20-49 years (OR = 2.52; 95% CI: 1.16, 5.54).

Location of the health facility significantly associated with the skills for searching health information among compared to rural areas. Workers located in urban health facilities were 2.84 times as likely to have skills to search health information (OR = 2.84; 95% CI:1.45,5.62).

5.8 Factors associated with health information-seeking behavior

Table 9 presents the factors associated with health information-seeking behavior among health care providers

Health care providers in the age group 20- 39 years were 1.58 times more likely to seek health information than older age group of 40- 59 years (OR = 1.58; 95% CI: 0.63,3.98). Single health care providers were found more likely to seek health information than married health care providers, however such association was not statistically significant (OR = 0.28; 95% CI: 0.06, 1.06).