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Assessing the use of the Internet for health purposes among students at the University of Ghana.

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DEDICATION

To my Parents, Mr. Emmanuel Kwabia and Ms. Monica Oforiwaa Okyere. The parents who

toiled with all they had, to see me through my educational endeavors.

PREFACE

This thesis was submitted in partial fulfillment of the requirements for the degree of Master of Science (MSc) at the Faculty of Medicine, Department of Telemedicine and eHealth, University of Tromsø, Norway.

This thesis was intended to serve as a framework on which health experts, researchers, and other health managers can develop strategic policies in addressing the health needs of people across the globe. It is also intended to serve as a reference material or source of information to the Ministry of Health, the Ghana Health Service (GHS) and all health institutions in Ghana, including the University of Ghana-Department of Public Health and the Health Directorate.

It is anticipated that this thesis would also serve as an information resource for IT program engineers and other stakeholders to come up with health solutions (programs) that will provide governments in Africa, an alternative to providing basic health services to its citizens. Furthermore, this thesis will serve as an information resource to international bodies like the African Union (AU), World Health Organization (W.H.O), the United Nations (UN) and the International Monetary Fund (IMF).

ACKNOWLEDGEMENT

ABSTRACT

The Internet, given its availability and affordability, is increasingly being used for different purposes, including health-related purposes. In this context, the Internet serves as a medium for people to interact frequently with the health care professionals, access health information online, and form and participate in online support groups. Yet, the extant literature has focused mostly on the use of the Internet for health purposes in developed countries. To bridge this gap and to ascertain the utility of the Internet for health purposes in developing countries, a cross-sectional survey was conducted involving 363 students at the University of Ghana, using self-reported methodology.

The study revealed that all the participants reported to use the Internet for health purposes. Particularly, the study found evidence that the participants use the Internet to seek for information online, interact with health professionals, engage in social support and group communication via popular social networks-Facebook and WhatsApp. Interestingly, the study also found that the majority of the participants own two or more electronic devices, used to access the Internet. More so, the availability of the Internet on campus, and easy access, motivated participants to use it. While the majority of the participants had indicated that they acquired knowledge and changed their lifestyle after accessing health information online, few had stated otherwise.

The general implication of the study is that the use of the Internet for health purposes is not limited to developed countries. Government and policy makers in Ghana can make use of the Internet to provide relevant health information and services. The extent of the Internet usage raises the optimism that geographical and physical barriers to seeking health care information can be overcome. The findings are briefly discussed and also, the implications of the findings for promoting access to health information discussed.

Key words
Internet, health information, health purposes, developing countries, Ghana.

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CHAPTER ONE

INTRODUCTION

1.0. Introduction

"A sick population cannot generate the productivity needed to maintain the acceleration of our economy." John Dramani Mahama (incumbent President of Ghana).

Therefore, "Improving health would lead to significant savings on health expenditure as a result of the reduced disease burden. A healthy, strong, intelligent and active human capital will be more productive, creating more wealth and thus increasing the Gross National Income (GNI) of Ghana" (MoH, 2005, p. 24).

1.1. Background

The quest to provide basic health care services for people across the globe remains a big challenge, including countries in Africa. These countries are confronted with an appreciable amount of challenges regarding their health care delivery systems. Of particular importance is the struggle to curb preventable diseases, spanning from malaria to the current Ebola epidemic. Indeed, developing countries are confronted with challenges, including inadequate funds, inadequate and poor infrastructure, and the   inadequate and lack or shortage of qualified health professionals who can help mitigate the situation. Ghana is no exception, which is currently struggling to comprehensively respond to the health needs of the populace.

The current universal health care system (National Health Insurance Scheme), which is thought to be modern and has the capability of resolving some of the pitfalls of the Ghanaian health care delivery system, has failed to adequately meet the basic health care needs of the citizens. Misappropriation of funds and geographical, political (interference of Government in appointing directors who may be unqualified) may contribute to the ill-functioning of the national health scheme.

As far back as 2001, leaders in Africa agreed in an Africa Union (AU) meeting held in Abuja, Nigeria, to allocate fifteen percent (15%) of their national budgets to improve health care (African Summit, 2001). As at 2010, evidence gathered revealed that little has been done by member states in achieving the set target. Only six countries (Botswana 17.8%, Burkina Faso 15.8%, Malawi 17.1%, Niger 17.8%, Rwanda 18.8%, and Zambia 16.4%) have met this commitment. Furthermore, 32 out of 53 African Union member states spend less than the US $40 recommended per person by the WHO with only 11 of these investing about US $5 or less per capita in health care (WHO, 2012).

Focusing on the Ghanaian health sector following the adoption of the Abuja convention, the Government's expenditure on health has increased significantly. However, it has not met the goals set and agreed by the AU. The allocations by the Government has been fluctuating between 10.5% and 12.5% in 2010 and 2012, respectively (SEND- GHANA, 2014). The inability to meet this commitment has resulted in a lack of motivation on the part of many health care personnel, driving them to seek for greener pastures (Brain drain) in Europe and America. This has had a major effect on the health care delivery systems in the country. Efforts from other health care personnel who decide to stay and serve their country are also overshadowed by the number of people they have to attend to. For instance, the doctor to population ratio in Ghana was 1:10,034, whilst the nurse to population ratio was 1:1,240 in 2011 (Ghana Health Service, 2011). The scale of the disproportionality is an indication of the low rate of health care professional. It is clear that the proportion between the healthcare professionals and the entire population- a total population of 25.90 million people- (World Bank, 2014) is an indication of low rate of health professionals serving the population.

In an attempt to address some of these challenges, it will be prudent for stakeholders to consider finding alternative means of addressing the basic health needs of its citizens. One of

the many approaches to address the challenge is through empowering the people to take their health into their own hands, by making health information accessible to all on a platform which can be reached by people irrespective of location, gender, age, etc, and that can be through the Internet. Also, the people can be sensitized through various health awareness programs created by the Government and stakeholders in order to help curb the situation.

Interestingly, efforts by the past and present Governments of Ghana in making Information and Communication Technology (ICT) education a part of students' curriculum at the primary, secondary and tertiary levels to accelerate the country's economic growth, has created that platform. This platform is also contributing to the expanding knowledge of the use of ICT in making life easier in all sectors of the country, including health.

More so, evidence gathered from studies conducted in Ghana points to the fact that a lot of people are using the Internet for various purposes (Borzekowski, Fobil, & Asante 2006; Hinsen & Amidu, 2006).

Currently, more people in Africa have access to the Internet today than as to having access to clean water, or even good sanitation (Lazuta, 2013). This may be due to the influx of giant telecommunication companies on the African markets with lots of enticing packages including Internet access. Data gathered from the National communication Agency (NCA) of Ghana suggest that, of about 24.97 million population, 24.4 million are mobile phone users (This numbers are indicative of the fact that individuals in Ghana can own more than one mobile phone) (IT New Africa, 2012). Evidence from the Mobile Data Market Trends gathered by the National Communication Agency (NCA) at the end of August 2014 indicated that Ghana has a total subscriber base (mobile phone users) of 14,615,048 (NCA, 2014). This basically implies that all smart phone users in Ghana can have access to the Internet, provided they can afford the data bundle.

The acquisition of knowledge in ICT through the educational system and the availability of the Internet across the country can be capitalized upon by students who have access to smart phones or other devices for accessing the Internet in their respective institutions, for health purposes.

1.2. Operational Definition

My operational definition for Health Purposes is an adaptation of what Cline & Haynes (2001), referred to as using the Internet to search for health information, interact with support groups or chat with a health professional.

1.3. Statement of Problem

Governments and stakeholders across the continent are tirelessly excavating new and innovative ways of ensuring that basic health care is available to all. Some of these innovations capture the introduction of the ICT in the educational curriculum, due to its ability to serve as a medium in addressing the health issues of its users irrespective of users' location, provided there is Internet access available. Although anecdotal evidence suggests that recent advancements and infiltrations of ICT have resulted in the use of the Internet for health purposes in Sub-Saharan Africa, few studies have examined these developments. The extant literature on the use of the Internet for health purposes is overwhelmingly dominated by studies conducted in developed or western countries (see Andreassen et al., 2007; Santana et al., 2011; Kummervold & Wynn, 2012; Vambheim et al., 2014). While some studies have been conducted on Internet use, among other Sub-Saharan African countries (see Awoleye, Oladipo, & Siyanbola, 2008; Batane, 2013; Oyeyemi et al., 2014), the study by Buami, (2013) and Borzekowski, Fobil, & Asante (2006) appeared to be the only studies that has examined this topical issue in Ghana. They also limited their study to examining teens in the junior high

schools and those not in schools. For this reason, it is not clear how tertiary students, who presumably have technologies (mobile phones, desktop computers, laptops, and tablets) to access the Internet, use it for health purposes. The current study, therefore, seeks to contribute to the literature by examining the use of the Internet for health purposes among tertiary students in Ghana. It is hoped that this study will add to the ways in which the Internet can contribute to the country's health care delivery approach, using students at the University of Ghana as a reference group.

1.4. Objective of the study

The main objective of this study is to access the use of the Internet for health purposes among students at the University of Ghana with the following specific objectives in mind:

1. To examine the extent of Internet usage among students for health purposes.

2. To unearth the means by which students use the Internet for health purposes.

3. To determine whether the availability and accessibility of the Internet influence users' for the use for health purposes.

4. To ascertain users' reasons for the use of the Internet for health purposes.

5. To examine the perceived outcomes of using the Internet for health purposes.

1.5. Research questions:

1. How often do the students use the Internet for health purposes?
2. By what means do students access the Internet for health purposes?
3. Does the availability and accessibility to the Internet influence users' use for health purposes.
4. What are the students' reasons for the use of the Internet for health purposes?
5. What are the perceived outcomes of using the Internet for health purposes?

1.6. Significance of the study

The purpose of this study is to investigate the use of the internet for health purposes among nursing students at the University of Ghana. By understanding the usability of the internet in this regard, IT developers and health care providers in Ghana will come up with new innovative ways of empowering people to take up their health into their hands, thereby increasing basic health care accessibility across the country. It will also serve as a framework on which health experts, researchers, and other health managers can develop strategic policies in addressing the health needs of students.

Furthermore, it can serve as a reference material or source of information to all stakeholders in the health sector of Ghana. It would also serve as an information resource to various international stakeholders in health, including the World Health Organization (W.H.O) and International Monetary Fund (IMF) as well as contribute to the existing knowledge already in the field.

1.7. Organization of thesis

This document has been organized into seven main chapters. Firstly, Chapter one entails the introductory aspect of the study that captures the background, statement of the problem, objectives of the study, research questions, and the significance of the study. Chapter two sheds light on relevant literature, Chapter three contains the theoretical perspective, Chapter four includes the methodology, Chapter five concerns the analysis of the data gathered. Chapter six contains the discussion, limitation and recommendations, chapter seven contains a summary and conclusion.

CHAPTER TWO
LITERATURE REVIEW

2.0. Introduction

This chapter addresses literature relating to using the Internet for health purposes. The first section introduces the background of the Internet, followed by Internet use across the world, and use of the Internet for health purposes. The chapter has been sub structured, highlighting literature from America, Europe and Africa, respectively.

For the purpose of this master thesis, literature was extensively sourced from a variety of databases in order to identify related and suitable articles for the research topic. The research topic is broad and cuts through different disciplines ranging from telemedicine, ehealth, information and communication technology to public health. The search was conducted on the following electronic databases: PubMed, Cochrane, National Library of medicine (NLM) and Google Scholar. The keywords used included: Internet usage, health purposes, developing countries, Smartphone use, Internet in Africa, health information, health net services, healthcare delivery and healthcare issues. From the literature gathered, the accrued information below was deduced.

2.1. Background of the Internet

The insurgence of Telemedicine, Telehealth, eHealth, Mobile Health, etc., has come to stay and contributed in making sure that life becomes easier for all across the world, by facilitating the provision of health services through the use of telecommunication devices and the Internet.

The Internet as a tool is gaining dominance in all facets of human lives. This can be attributed to the fact that the Internet provides people with the opportunity to seek for a wide range of information on relevant issues, including health related issues and services.

The Internet first came to light in the early part of the 1960s. It was basically used by the United States Department of Defense in facilitating its military operations. However, it was later commercialized and widely accepted as evidenced by the rapid use of the Internet, which can be traced back to the "information revolution of unprecedented magnitude" (Jadad & Gaghari, 1998, p. 611). This movement gained roots in the era of widespread use of Personal Computers (PC); and Internet use "exploded" in the fall of 1994 (Breek, 1997, p. 1032).

Before the commercialization of the Internet, magazines, newspaper, books and information offered by health professionals and loved ones, served as sources of health information for people in need (Kummervold & Wynn, 2012). Although these sources of information still exist today and remains important, it has been acknowledged that the Internet has been embraced and rapidly becoming the central source of Health information across the globe (Andreassen et al., 2007). Therefore, it is not uncommon for people in Western and Sub-Saharan African countries, to consult the Internet on health related issues (Borzekowski, Fobil, & Asante, 2006).

2.2. Use of the Internet
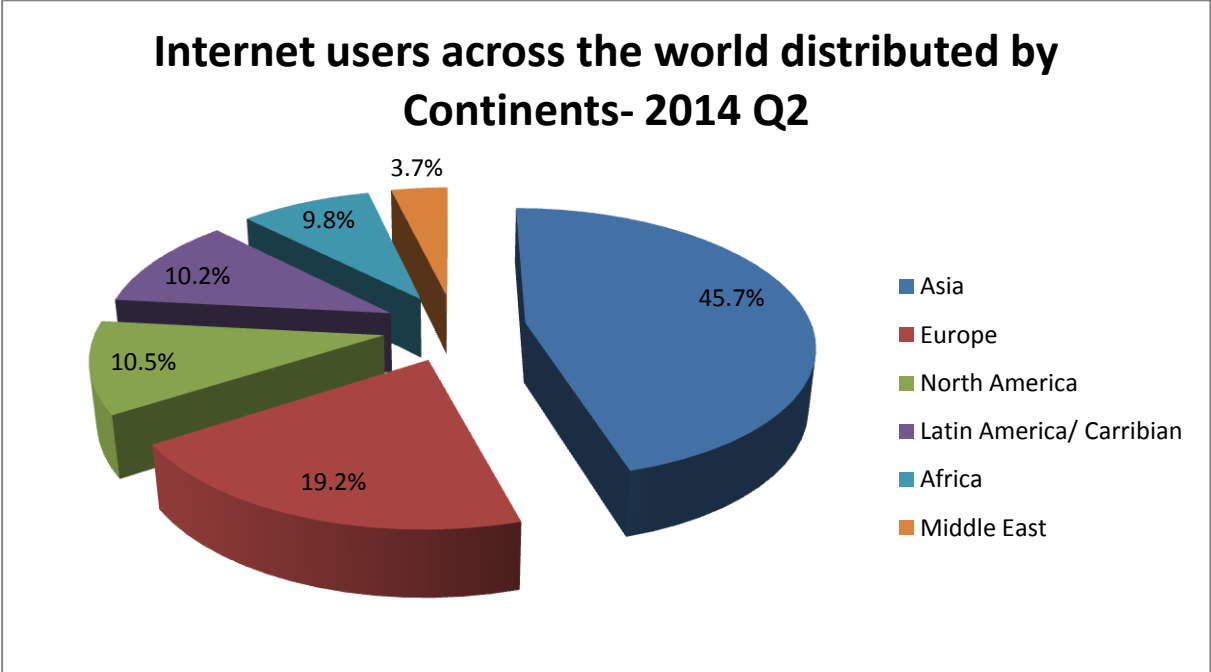
Figure 1. **The estimated number of people using the Internet in the world-3.035,749,340 by 30th June 2014, (Internet World Stats 2014).**

The use of the Internet is on the increase. Data marshaled from the Internet World Statistics indicate that about 1.971 billion, representing 28% of the World's population as of September, 2010 were using the Internet. By 31st December, 2013, the number had increased to 2.802 billion Internet users across the globe. By 30th June, 2014, the number of Internet users had reached an estimate of 3.035 billion. The Figure 1 suggests that in Europe, there are about 582 million users representing 19.2% of the estimated total, in North and Latin America, 310 million and 320 million, representing 10.5% and 10.2%, respectively, and Africa has 297 million of the users, representing 9.8%, and the Middle East, 110 million representing 3.7% (Internet World Stats, 2014).

2.3. Use of the Internet for Health Purposes

The Internet is a tool considered by many to facilitate the accessibility of some health services that hitherto would have required one to be present in a health facility, in the comfort of users'

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home. According to Harrison, Barlow and Williams (2007), the Internet serves as a rich source of health information, hence, considered, the largest online medical library with more than 100,000 health-related websites. Notably, It does not only functions as a rich source of health information, but also, facilitate interactivity between professionals and health seekers through an electronic or communication tools to gain and relay health information (Cline and Haynes, 2001), which Fox and Raine (2000) believe, influences the health decisions and improves the self-care of users. Street (2003) also cemented the assertions of Fox and Raine (2000), by adding that using the Internet has the potential to empower users and stimulate them to participate in their own health care

It may also offer support for interpersonal and social interaction, and it can offer tailored information and anonymity (Cline and Haynes, 2001; Rice and Katz, 2001, Gabarron et al., 2012; Gabarron et al., 2014).

It is also assumed that using the Internet, helps users' make important health care decisions by connecting with other users who have access to health information, and interacting with health professionals and social support groups (Boase et al., 2006).

The interactive features of the Internet include; emailing, chatting, and discussion forums. These features provide users with the opportunity to engage in activities such as, leave their health-related questions and establish contact with others, exchanging and sharing experiences about a disease, and making inquiries from best physicians available in the field to address their health issues (Dumitru, 2007; Hale et al., 2010*).

Using the Internet for health purposes has no discrimination. Both the rich and the poor, old and young are entitled to use it, provided they can access the Internet. According to Fox and Duggan (2013), one-third of all adults have engaged in the use of the Internet for diagnosing a medical condition. Furthermore, one-third of Internet users also access blogs, online

newsgroups, and web sites regarding the medical experiences of others when they get access to the Internet (Fox, 2011). Some users with chronic diseases such as hypertension or diabetes are also able to take part in online patient support groups, where they share experiences and treatment options, establish contacts with physicians and other patients, and obtain meticulous information regarding their conditions (Fox, 2011).

The use of social media via the Internet is another wave that is propelling the health industry towards a new paradigm shift. The "Social media is a form of electronic communication intended to create online communities where the users share information, ideas, personal messages, and other content" (Avci, Celikden, Eren and Aydenizoz, 2015 p. 2.). Brockman, Christakis and Moreno (2014), argue that some users also use social networking platforms such as Facebook, Twitter and WhatsApp, as a place for making health research. Social media are also considered as easy to use, access and exchange important information, hence, extensively being used in medicine.

Currently, health information, that is available through the social media platform are now being used as reference guides for sensitive health issues by non medical professionals, physicians, and students in Health (Denecke and Nejdl, 2009). However, the use of social media for health purposes, has the potential of breaking or eliminating barriers or distinctions between health professionals and non professionals, patient relations and medical ethics when patronized and used by students and health professionals (Avci, et al., 2015)

Mansfield et al., (2011) even reported that Physicians are also increasingly using social media, both professionally and in their daily lives. A study by Chretien, Azar, and Kind, (2011), also revealed that 48% of physicians on Twitter have posted links to their blogs. Some

doctors with the passion of reaching out to patients via the Internet have also created an all-inclusive wikis, web pages and platforms, such as AskDrWiki.com where patients can receive information about various diseases and pose questions to specialists (Denecke and Nejdl, 2009).

It has also been acknowledged that some physicians use social media to exchange information about professional problems and clinical experiences (Hyman, Luks and Sechrest, 2012; Anikeeva and Bywood, 2013).

Without the Internet, it will be very difficult to carry out all the enumerated communication based health activities above, through other media forms such as newspapers, radio, or television *(*Ayers and Kronenfeld, 2007).

Using the Internet for health purposes can be said to have both advantages and disadvantages. The advantages as above cannot totally overshadow the disadvantages associated with using the Internet. In considering some of the disadvantages of the Internet like any other technology include; high costs (for many potential users), the need for skills and knowledge in accessing and using the Internet, technical language that might be difficult to understand for many, and uneven access (Cline and Haynes, 2001; Rice and Katz 2001). Additionally, the use of the Internet can also pose users with some obstacles such as overload, disorganization, complex searching commands, medical language (terminologies). Also, Internet use can pose as a danger to users due to the lack of peer review, erroneous or disingenuous information, risk-promoting messages and Internet addiction (Cline and Haynes, 2001; Rice and Katz, 2001).

In order to address some of these obstacles and dangers associated with the use of the Internet, it may require special knowledge in computing and the use of the Internet.

Regardless of these challenges, Lemire, et al. (2008) argue that the public's involvement in managing their own health through the Internet keeps growing and has become a strategic issue in the field of health. This shift in the public's desire is a positive one and may be attributed to different factors, such as changing knowledge, attitudes, technologies, the availability of Internet access, and approaches to care (Williams, 2002).

2.4. Literature from North America

Use of the Internet for health purposes in the world has been on the increase for over a decade now. Findings from the Pew Internet and America Life Project revealed that 46 million adult Americans used the Internet to find health care information in March 2002. By October 2002, the figure was 73 million, and by November 2004, 95 million (Fox, 2005). Among the surveyed group in 2004 (537 users), those most likely seeking online health information were ''women, those under 65, college graduates, those with more online experience, and those with broadband access'' (Fox, 2005).

Interestingly, a decade over the line, the number of users among the adult and young has changed progressively. Data gathered by the Pew Internet and America Life Project indicated that more than half of the US adult population between the ages of 18 to 44, and 95% of all teenagers between 12 to 17 years were using the Internet (Pew, 2012). Furthermore, a recent survey conducted by PEW in January 2014 revealed that 87% of American adults use the Internet, up from 14% in 1995.

In a study conducted by Baker et al. (2003), the extent of Internet use for health among a representative sample of more than 60,000 in the US between the years 2001 and 2002 were measured. Data from 4764 respondents aged 21 years or older who were self-reported Internet users were analyzed. To their surprise, approximately 40% of respondents with Internet access reported using the Internet to search for advice or information about health or health

care in 2001. 6% reported using e-mail to contact a physician or other health care professional. About one third of those using the Internet for health indicated that use affected decisions made regarding their health. However, very few reported impacts on measurable health care utilization. 94% said that Internet use had no effect on the number of visits to their physician. 5% or less also reported using the Internet to obtain prescriptions from physicians. The researchers concluded by stating that their findings differed from what most researchers in the field had claimed. They argued that despite the fact that many people use the Internet for health information, the use was at that time not as common as it was sometimes reported.

Adding on to the rate of Internet usage in the US and considering its associated benefits, Peluchette and Karl (2008) examined the social networking habits and attitudes of 433 undergraduates at a mid–sized university in the Midwest, and found that the large majority of students (80%) used one or more social networking sites. Facebook, they noted, was used most heavily.

Fortson et al. (2007) also highlighted a general pattern in the literature on the differential use related to gender, which suggests that women use social networking sites to communicate with others and for educational purposes more frequently than men do, while men tend to turn to the Internet as a source of entertainment with greater frequency than women.

Brockman, Christakis and Moreno (2014), argued that social networking platforms such as Facebook, Twitter and WhatsApp can be used for conducting health research. They carried out studies among 18 year old participants in the US, to find out if it is possible for health professionals to friend adolescents and provide health advice using social networking sites. Their goal was to assess the willingness of these adolescents to accept a friend request from an unknown physician. They conducted two separate studies. In the first study, 127 participants (males) received a friend request from the physicians. 49.6% of the participants accepted the friend request. After 9 months, 76% maintained the online friendship, 12.7%

defriended the study profile and 11% deactivated their profile. In the second study 338 participants (females) received a friend request; 99.7% accepted the friend request. Over 12 months, 3.3% defriended the study profile and 4.1% deactivated their profile. In total, the 12-month friendship retention rate was 96.1%. In conclusion, they asserted that it is possible for health care providers to provide health advice to adolescents using the social media platform.

Similarly, studies conducted by Berger et al. (2005) and Klein and Wilson (2003), led to the assertion that the Internet was particularly appealing to young people as a source of information and advice, especially when they wanted information about sensitive or stigmatized illnesses. For example, in conditions like herpes, urinary tract infections, and mental health issues.

Furthermore, a study by Aslam et al. (2014) explored the power and benefits of the Internet by gathering tweets on the twitter website containing the keyword "flu" within a 17 mile radius from 11 US cities. Upon analyzing the data, they opined that a social media platform (Twitter) could serve as a supplementary surveillance tool in analyzing influenza outbreaks.

Focusing our attention on Internet usage for health purposes among students, several studies have indicated that, a majority of college students in the US make use of the Internet in this regard. In a study conducted by Anderson (2001), he argued that 83% out of 1,302 college students from 8 different institutions used the Internet. Jones (2002) also ascertained that 86% out of 2,501 college students he surveyed, had gone online and their most frequently reported online communication activities were through e-mails (62%) and instant messaging (29%). 5% or less of college students had used Web boards, chat rooms, and newsgroups. Fortson et al. (2007) affirms this by arguing that about 90% of college students they surveyed in a Southeastern regional University acknowledged using the Internet on a daily basis. Cotten and

Jelenewicz (2006) reported higher rates of Internet usage among freshmen sampled from a mid-sized research institution in the "Mid Atlanta region of the United States"(p. 499). They indicated that 97% of their participants (N= 232) had accessed the Internet multiple times on a daily basis.

Furthermore, Escoffery et al. (2005) conducted a survey among 743 undergraduate students at two different US institutions, to examine their Internet use, health-seeking behaviors and attitudes related to the use of the Internet to obtain health information. Overall, 74% of the students reported having ever reviewed health information online, and more than 40% acknowledged searching the Internet for information through different search engines. The study also found differences in Internet use for health information by gender (most women) and by level of Internet experience. Based on their findings, they argued that the Internet could serve as a desired health- promotion channel for college students since one third of the students indicated that they would also like to participate in an Internet health program.

2.5. Literature from Europe

The data gathered from the Internet world statistics are suggestive of the fact that most Europeans are using the Internet. It could be that users use the Internet for purposes other than health, such as; communicating with friends, to work or even satisfying their curiosity during leisure time.

However, there is a considerable amount of studies that have been conducted in Europe pointing to the fact that the use of the Internet for health related purposes is on the increase.

Although some researchers have limited themselves to categories of Internet use among users with somatic and chronic diseases (See Tanis, 2008; Van Uden-Kraan et al., 2009; Fogel, Fajiram and Morgan, 2010 and Mishoe, 2009); and other researchers also have expanded this topic only for specific types of use, one example is the utilization of online forums (see Tanis,

2008; Van Uden-Kraan et al., 2009), it is clear that people are using the Internet for health related purposes (Siliquini, et al., 2011).

The use is somehow subjected to indicators such as gender, age, educational level and occupation. One such study was carried out in Italy by Siliquini et al. (2011) with the aim of providing evidence about the prevalence of Internet use for health-related purposes. The study revealed that out of 3018 respondents between the ages of 18 and 65 years, approximately 65% had used the Internet, and 57% reported using the Internet to search for health-related information. The usage was attributed to quick access and a large amount of information.

According to Bujnowska-Fedak (2015), among the Polish, the proportion of the population that uses the Internet for health-related purposes increased significantly from 41.7% in 2005, 53.3% in 2007, and 66.7% in 2012. Among the same population, the Internet has also become an important source of health information for almost half of the Polish citizens, overtaking other sources including; the television, radio, press, and courses or lectures in the ranking list (Bujnowska-Fedak, 2005).

Furthermore, a study conducted in Spain among 600 university students revealed that the majority of the students were using the Internet for accessing mental health information online. However, users had a vivid mistrust in the online mental health information retrieved (Montagni, et al., 2014).

Adding to the established points above, a study by Kummervold & Wynn (2012), examining use in five countries in Europe, namely; Norway, Denmark, Germany, Greece and Portugal, also revealed an increase in the use of the Internet for health purposes. In the same study, they indicated that, the Eurobarometer study in 2002 found out that, overall 23.1% of the population in current 15 European Union (EU) countries had used the Internet seeking for information about health. By June 2011, the number of Internet users had increased. Around

94% of users between the ages 15 to 24 forming 66% of the entire EU population, were using the Internet. (Eurobarometer, 2011).

In Europe, the Norwegian Center for Integrated Care and Telemedicine was among the first institutions to conduct studies on the use of the Internet for health purposes (Kummervold & Wynn, 2012). In the year 2000, the first national survey was conducted using computer assisted telephone interviews with a target sample of 1000 respondents (Wangberg *et al*., 2009). The Study was repeated in 2001, 2003, and continued as The European Health Trends survey in 2005 and 2007, which led Wangberg et al. (2009) to assert that about 80% of Norwegians would become Internet users by 2010 (Kummervold & Wynn, 2012).

In another development, a study conducted through telephone interviews by Andreassen *et al*. (2006) on health-related use of the Internet among Norwegians revealed that 58% of the respondents in 2005 had used the Internet for health purposes, compared to 31% in 2001. 37% of the respondents believed that the Internet was an important or very relevant source of health information (compared to 72% for face-to-face interaction). Also, 23% were reassured by the information they had found on the Internet. However, 10% had become worried as a result of the same information acquired on the Internet.

Again, a survey conducted by Andreassen et al. (2007) in Europe in seven countries with a sample size of 7903 also revealed that, 4906 people were Internet users and distributed in percentages as follows; In northern Europe; Denmark (62%), Norway (59%), Germany (49%), eastern Europe; Poland (42%), Latvia (35%), and southern Europe; Portugal (30%) and Greece (23%). In a joint population of these seven (7) countries, a total of 44% (71% the Internet users) is reported to have used the Internet for health purposes. Reading about health and illness was the most common activity among Internet users for health purposes. Making reference to their results, 44% of Norwegians had searched for lifestyle information and 40%

had felt inspired to change health behavior as a result of using the Internet for health purposes.

The results above clearly indicate that a sizeable number of Norwegians use the Internet for health activities. Also, the use of the Internet for health purposes among Norwegians is increasing as evidenced by the Statistics Norway (2007) pointing out that 66% of Norwegians had used the Internet on an average day, and 88% had access at home. Again, it was evident that Internet use was higher among men, younger individuals and those with higher education (Wangberg et al., 2009).

Ayantunde, Welch and Parsons (2007) also carried out studies in the UK regarding patients' or carers' use of the Internet and other sources of health information. The aim was to determine how useful health information over the Internet was to users and to assess the potential use of validated health information on the Internet. The study population consisted of patients and their significant others, 18 years and above that attended the outpatient clinics at Nottingham City Hospital for a period of two weeks in July 2005. In all, 688 out of 800 questionnaires administered were completed (83%). The questionnaire captured information on demographics, frequency of the use of the Internet, sources of health information, satisfaction rating of health information gathered on the Internet and their interest in using trustworthy health information from an Internet site if made available.

From their analysis, the results indicated that 63% of the respondents had access to the Internet, of which 42% had used it to access health information prior to the study. 7.5% of the respondents claimed they had no access to the Internet, however, they had others check health information on the Internet on their behalf. 95% of the respondents who had used the Internet for health information scored the information between average and excellent. Interestingly, 82% of those with Internet access and 21% of those with no access appeared to be interested in using trustworthy health information on the Internet.

A recent study by Newhouse et al. (2015) on the use of emails to interact with health professionals across 14 European countries revealed that Denmark, among these countries recorded the highest level of emails sent/received (507/1000, 50.70%). The lowest level reported was by participants in France (187/1000, 18.70%). Also the majority of the participants who claimed to have used the email to communicate with health professionals were Men, as did respondents in the 16-24 age group and those educated to the tertiary level or still within the education system. However, the researchers also reported that the low reported use of emails in interacting with health professionals, by country, may be attributed to local health policies and technical infrastructures.

2.6. Literature from Africa

Although a lot of studies on the use of Internet among students have been conducted in the Western world, much cannot be said in relation to Internet use for health purposes among students in Africa. However, some evidence suggests that some of the youths in Africa are using the Internet for health purposes. Batane (2013) conducted a study to investigate the Internet use in a total of 117 students sampled from 4 from different colleges in Botswana. The respondents acknowledged using the Internet, with the majority of this access taking place on college campuses due to the availability of the Internet. However, they study revealed that entertainment and communication comprised about 75% of young people's Internet time.

In Ghana and Nigeria, both West African countries, the story is different. A study conducted by Awoleye, Oladipo & Siyanbola (2008) revealed that about 92% of undergraduate students at the Obafemi Awolowo University in Nigeria, used the Internet consistently. These students

used the Internet mostly for e-mail, information search and online chats. Udende (2010) also revealed that the majority (80.9%) out of 385 Nigerian students he studied had used the Internet for academic purposes.

In Ghana, studies conducted by Hinsen & Amidu (2006) at the University of Ghana Business School among final year students also indicated that the majority (more than 75%) used the Internet as a tool for academic purposes. Buami (2013) examined the reasons for the use of the Internet and Internet access among Junior High School students in Ghana's capital city of Accra. He found that out of 255 youths sampled, close to half (49.8%) had used the Internet to do their assignments, 35.7% used it to chat with family and friends and 5.9% read news stories on the Internet. About 72% of the 255 sampled youth claimed they had no difficulty in accessing the Internet.

Also, Borzekowski et al. (2006) found in their study of Ghanaian teens' use of the Internet for health information that a large percentage, irrespective of their school status, gender, age, and ethnicity turn to the Internet for health information. A total of 778 participants between the ages 15 to 18 completed a detailed media and health information survey. Two-thirds (66%) of the in-school youth and approximately half (54%) of the out-of-school youth had previously gone online. Of all these Internet users, 53% had sought online health information; The users also reported positive perceptions of online health information.

2.7. Conclusions

From the above literature, it is clear that users' are using the Internet for health purposes. However, in most of the studies reviewed, emphasis was placed on examining the importance of variables such as gender, age, education, and occupation associated with the use of the

Internet for health purposes (see Andreassen et al., 2006; Escoffery et al., 2005; Batane, 2013).

Even though a lot of studies have been conducted in the developed and some developing countries, on the use of the Internet for health related activities, few studies have been conducted in Ghana as previously noted.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.0. Introduction

This chapter introduces the theoretical framework on which the study was conducted. The identified theory, which is the Technology Acceptance Model was presented and discussed, including its background, evolution, extensions and the researcher's adopted model.

The study was carried out in one of the evolving fields in IT in the West African region (see Awoleye, Oladipo and Siyanbola, 2008; Borzekowski, Fobil and Asante, 2006; Buami, 2013), especially in Ghana, where some researchers are now trying to uncover how people are using the Internet after the inclusion of IT in the curriculum of schools spanning from the primary to tertiary levels. However, considerable evidence gathered from the work of some researchers (Lui, Liao and Pratt, 2009; Park, 2009; Teo, 2009) indicate that although the majority of educational institutions across the globe is seriously investing in IT, many of these acquired technologies are underutilized or in the worst case scenarios, abandoned entirely. This can be partly traced to limited user acceptance of the technologies (Shih-Chih, Shing-Han, Chien-Yi, 2011, Obstfelder et al., 2007).

Previously, before the introduction of the Internet in the country and schools, patients (both students and non students) had to join long queues in order to be attended to by a doctor in Ghana. Some of the patients report with minor ailments that does not require hospital visitation provided they knew what to do (basic first aid measures). Others even visit the consultation rooms just to ask questions in relation to their health or loved ones. Now, with the commercialization and availability of the Internet, the elite (those who can read and write) in the society can access health information for themselves, communicate with health professional or support groups in the comfort of their home.

The topic for my research, which focuses on assessing students' use of the Internet for health purposes is geared towards unearthing how these students, who have been provided with free

From the technological point of view, the provision of Internet access to students at the University of Ghana could be viewed as the application of a new technology. As such, the Technology Acceptable Model will be a suitable framework in discussing and unraveling its usage. In order to achieve this, the Unified Theory of Acceptance and Use of Technology (UTAUT) model proposed by Venkatesh et al. (2003) was adopted and employed in the study. Their model emerged through a revision of the Technology Acceptance Model (TAM), a revision that some scholars in the field did not adopt. Below is the evolution of the TAM and some of the extensions, which have given birth to other acceptable models in the field of Information systems (IS).

3.1. The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was proposed by Davis in 1986. The Technology Acceptance Model is a theory modeled from the Theory of Reasoned Action (TRA) and argued to be one of the accepted models when it comes to technology acceptance and use (Park, 2009).

The TAM states that peoples' decision to use a piece of technology is influenced by their intentions to use the technology, which eventually influence the actual use (Gammon et al., 2008; Wynn et al., 2012).

The TAM offers a view of understanding the adoption and use of information technology (Legris, Ingham, and Collerette, 2003; Park, 2009). The model has been adopted in many studies that deal with user acceptance of technology (Lee, Kozar, and Larsen, 2003; Legris, Ingham, and Collerette, 2003; Park, 2009; King and Hu, 2006).

In adding to the above established points, Or et al. (2011) used the TAM in measuring the acceptance of consumer health informatics technologies such as m-Health, e-Health and Telemedicine. Moon and Kim (2001) used it to explain the users' acceptance of the world-

wide-web context; Lin et al. (2007) to clarify the e-stock users' behavioral intentions; and Chen and Chen (2009), understand automotive telematics users' usage intention.

Despite the numerous praise and ratings marshaled by the TAM, some researchers view it as a robust but parsimonious theory (Shih-Chih, Shing-Han, and Chien-Yi, 2011). As such, a lot of studies have recommended revising and extending the Technology Acceptance Model. For example, Venkatesh and Davis (2000) proposed TAM2 as a new version of TAM; Venkatesh et al. (2003) proposed the Unified Theory of Acceptance and Use of Technology, and Lin et al. (2007) proposed the TRAM (integration of Technology Readiness and Technology Acceptance Model).

3.2. History/ Background of TAM

The TAM was propounded by Davis (1989) in MIS Quarterly. It was proposed to throw more light on why a user accepts or rejects information technology by adopting the Theory of Reasoned Action (TRA) (Davis, Bagozzi, and Warshaw, 1989). The TRA, according to Ajzen and Fishbein (1980), defines the relationship between beliefs, attitudes, norms, intentions and behavior. Accordingly, the theory posits that "an individual's behavior, whether the use or rejection of a technology, is determined by one's intention to perform the behavior and is influenced jointly by the individual's attitude" (p. 302). More so, the "attitude toward a behavior is influenced by the beliefs about the consequences of the behavior and the effective evaluation of those consequences " (p. 29).

In the 1970s, managers, stakeholders and researchers were desperately searching for solutions as to why newly implemented technological systems, which were aimed at reducing workload and increasing efficiency and productivity were being rejected (Chuttur, 2009). Davis, in his quest to help resolve this problem, undertook a study to unearth the cause of the problem. The aim of his study was to discover better ways of predicting and explaining the use of an

information system (Davis, 1989). His study gave birth to the TAM, which focused on two main constructs, that is the **Perceived Usefulness (U)** and the **Perceived Ease of Use (EOU)**, which later became the fundamental determinants of system use.

TAM provides a foundation on which external variables, which influence the components enumerated by Ajzen and Fishbein (1980), can be linked. They include; belief, attitude, and intention to use.

Furthermore, Davis (1985) opined that users' interest in using a particular system will depend on a number of factors, that according to him include; Perceived Ease of Use, Perceived Usefulness and the Attitude toward using a particular system. He indicated that the attitude of users', which is influenced by the Perceived Ease of Use and Perceived Usefulness, can play a greater role in the use or rejection of a particular system.

3.3. Evolution and extensions of the TAM

As time progressed, Davis subjected his model for revisions and to include other variables (External) in modifying the relations in the model he initially propounded due to concerns raised by fellow researchers in the field. These researchers also made extensions of the TAM to include some variables considered to have been omitted, but very influential in the prediction of acceptance or rejection of a technological system. Some key models in the evolution have been depicted in the diagrams below.

3.4. TAM (1a)

The Technology Acceptance Model (TAM)
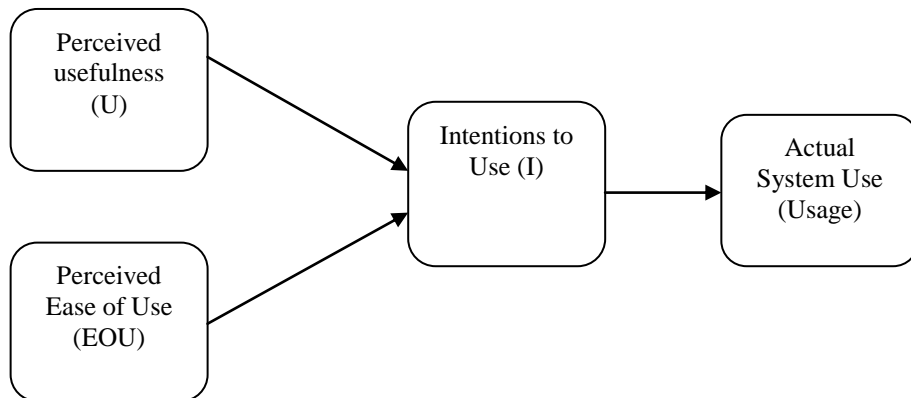
Figure 2. **A diagram depicting the first TAM as proposed by Davis, (1986)**

3.5. TAM (1b)

Technology Acceptance Model (TAM)
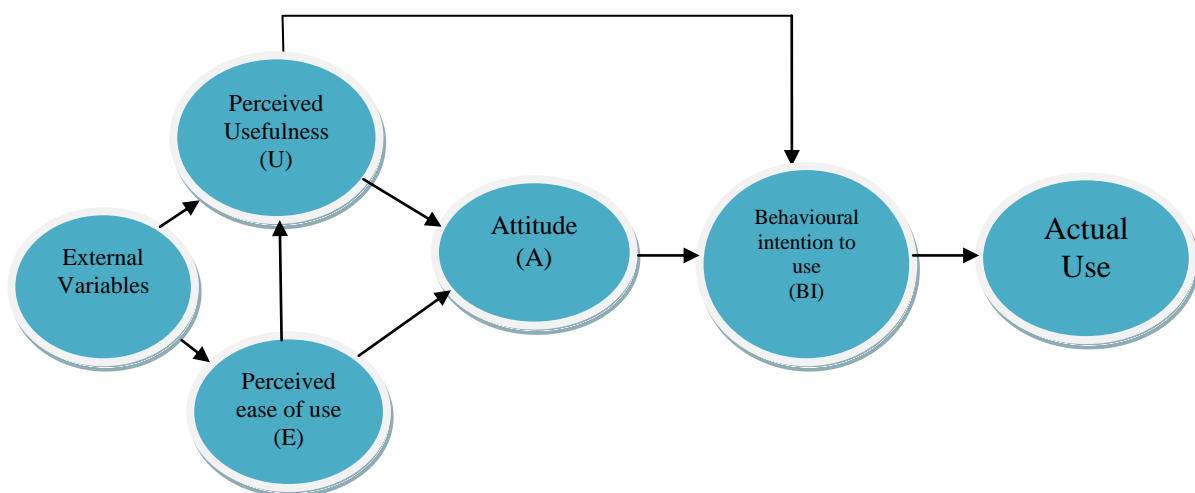
Figure 3. **A diagram depicting TAM as proposed by Davis, Bagozzi & Warshaw, 1989**

According to Davis, Bagozzi & Warshaw (1989, p. 320), the **Perceived usefulness (U)** is defined as "the degree to which a person believes that using a particular system could enhance his or her job performance". In contrast, they defined the **Perceived ease of use (E)** as "the

degree to which a person believes that using a particular system would be free of effort" (p. 320). They also asserted that once users perceive one system to be easier than the other, users will likely go for the easy one. And system that is rated high in usefulness will be used. The actual system use is determined by the users' attitude (A) and intention (BI) to use the system and the relation between A and BI. All things being equal, peoples' intention to use or reject a particular system can yield positive results (BI= A+ U).

The contrast "external variables" may have a significant effect on the belief of a user towards a system since it includes systems characteristic, user training, user participation in design, and the nature of the implementation process (Venkatesh & Davis, 1996).

3.6. TAM (1c)
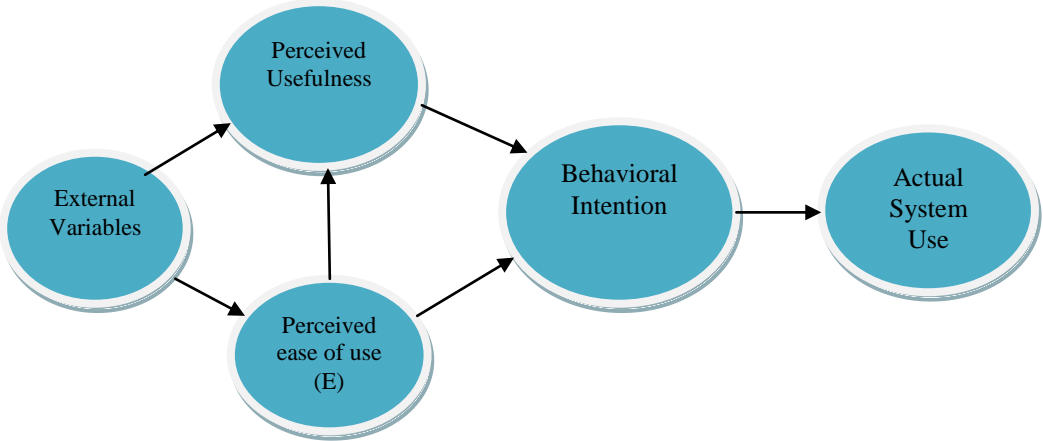
Figure 4. **A diagram depicting the final version of TAM (by Ventakesh & Davis, 1996)**

3.7. TAM 2

Technology Acceptance Model (TAM)
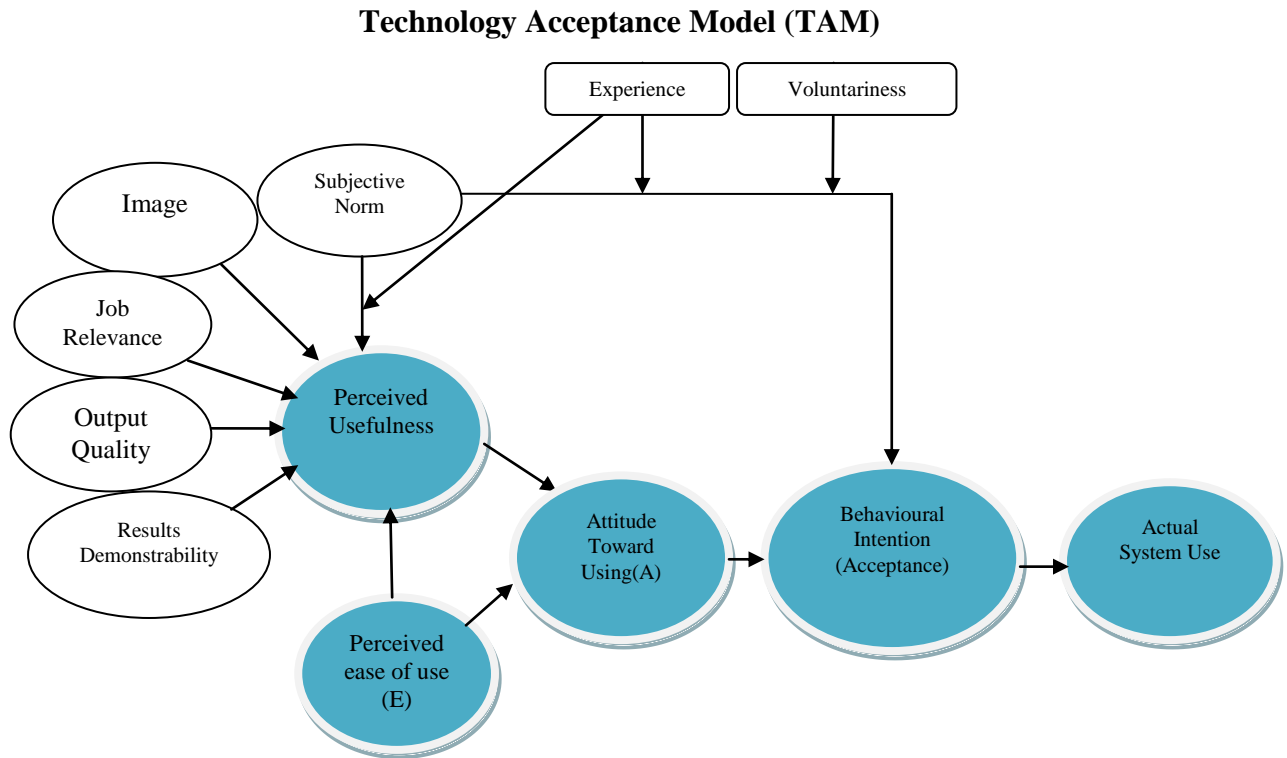
Figure 5. A diagram depicting the TAM 2 (by Venkatesh & Davis, 2000)

Venkatesh and Davis, (2000) found some limitations with the TAM proposed by Davis (1989) after carefully examining its usage. They argued that the first TAM could not go beyond the general items that measured perceived usefulness and perceived ease of use, making it difficult to identify the reasons behind the perceived ease of use or the perceived usefulness variables used in the model. More so, most TAM related researches had focused on only the voluntary environments, paving little way for mandatory settings (Chutter, 2009).

Addressing the identified limitations, Venkatesh and Davis (2000) proposed some additional variables that would serve as antecedents to the perceived usefulness variable in TAM. This new model was called the TAM 2.

TAM 2 is an extension of the original model developed to explain perceived usefulness and usage intentions, including social influence (subjective norm, voluntariness, and image), cognitive instrumental processes (job relevance, output quality, and result demonstrability) and experience. The new model was subjected to tests in both voluntary and mandatory settings. The results generated strongly supported TAM2 and explained 60 percent of user adoption using this updated version of TAM (Venkatesh and Davis, 2000).

3.8. Unified Theory of Acceptance and Use of Technology (UTAUT)
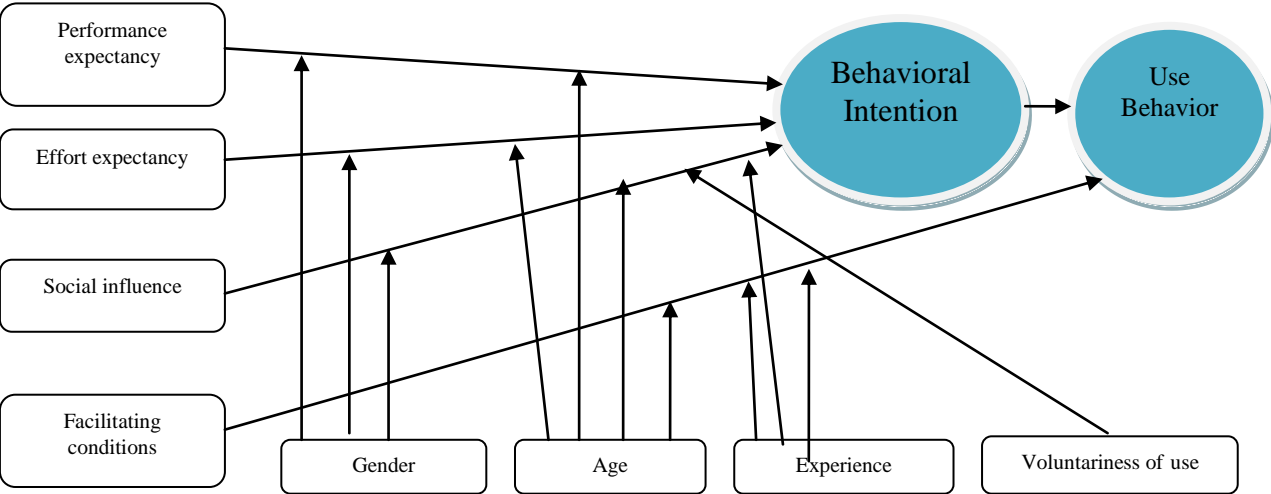
Figure 6. **A diagram depicting the UTAUT Research model by Venkatesh et al. (2003).**

The UTAUT was developed by Venkatesh et al. (2003) to assess the likelihood of success in implementing a new system or technology. It was developed using 4 core determinants of intentions and usage **(facilitating conditions, social influence, effort expectancy, and**

performance expectancy), with up to 4 moderators of key relationships (**experience, voluntariness, gender, and age**) that will directly determine intention and usage behavior.

The UTAUT model places perceived usefulness into a concept of **performance expectancy** and perceived ease of use into **effort expectancy**. The **social influence** is that variable which captures attitudes and influence from colleagues, leaders and company or institution cultures that forces end users to use or accept the system in question. New in this model is the determinant **facilitating conditions** for usage behavior. The facilitating conditions is interpreted as how individuals believe that there are organizational and technological infrastructure in place for the system use (Venkatesh et al., 2003).

The model was tested in 2 new institutions and achieved encouraging results. As such, the model could be welcomed and applied by key managers in understanding required actions necessary to achieve a high level of acceptance. The UTAUT presents a conceptual framework that can explain individual acceptance of IT (Venkatesh et al., 2003).

3.9. The Theory of Planned Behavior (TPB)
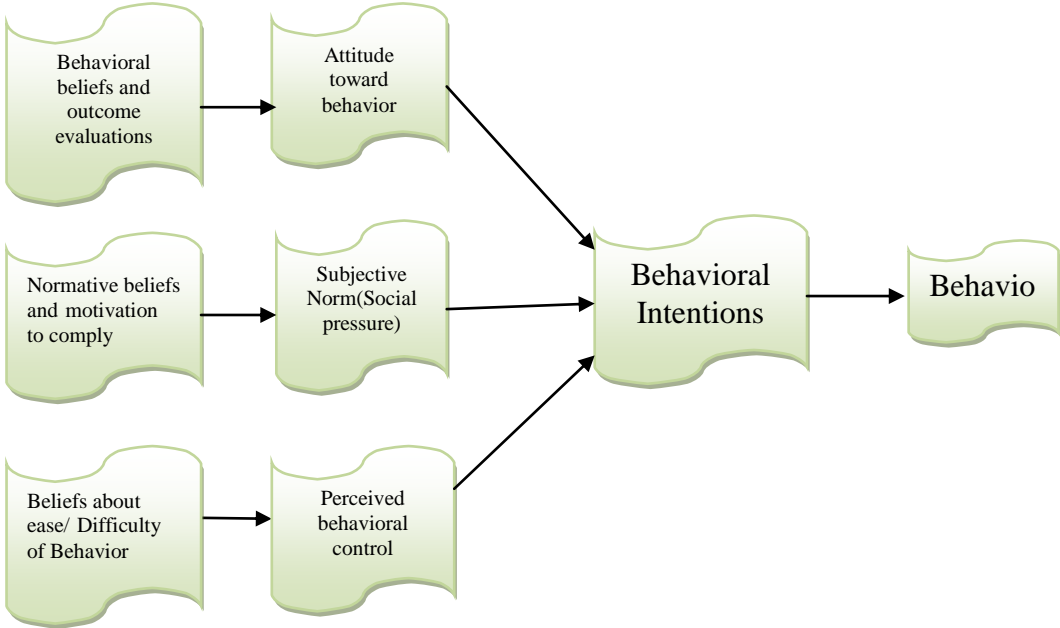
Figure 7. **A diagram depicting the Theory of Planned Behavior (TPB) by Ajzen, 1985.**

The theory of Planned Behavior (TPB) was proposed by Ajzen (1985). This theory in addition to the TRA, takes into account the Perceived Behavioral Control (PBC), which refers to the perception of control over the performance of a given behavior. It has two (2) influencing beliefs. That is the control beliefs and perceived facilitation. The control beliefs include perceived availability of skills, resources and opportunities. The perceived facilitation belief is the individual's assessment of available resources of a given set of outcomes.

In an attempt to carry out an experiment with the aim of predicting the intention of 262 participants using a spreadsheet application, Mathieson (1991) applied both the TAM and TPB. In his findings, it was evident that both theories were suitable to predict system usage. However, While the TPB considered beliefs that were specific to a given system, the TAM served as a simple model that could be applied to any system. Hence, the increase in usage of this model by many researchers in the field.

Making deductions from the reviewed literature and building on what other scholars have proposed, I am convinced that what Venkatesh et al. (2003) had proposed, that is the UTAUT will be suitable in assessing the use of the Internet for health purposes among students at the University of Ghana. This is because the UTAUT make room for variable that could have a direct influence on both the users perceived usefulness and the perceived ease of a technology resulting into behavioral intention and use behavior. In the case of my study, since I have limited myself to students, these variables include the age, sex (gender), level of education, program of study and residential status (social influence), acquired IT skills (experience), health consciousness and accessibility to a technological device and free Internet by the users (facilitating conditions). Hypothetically, all these factors could contribute to influencing one's decision or behavior in using the Internet for health purposes.

When students of the University of Ghana, who have access to Internet perceives technology to be useful and easy, the tendency of using it will be high. Notably, these students have the

skills in using the technology (Internet) provided by the University as evidence by the inclusion of IT in the educational curriculum spanning from the primary to the tertiary. Adding to the acquired skills, other factors could play a role in contributing to the use of the technology in question. These factors include age, sex, educational level, program of study, residential status, health consciousness and the accessibility to a technological device and Internet. All these factors are inculcated in the model proposed by Ventakesh *et al,* (2003).

After perceiving a technology to be useful and easy, that is when users begin to explore what other benefits can be amassed from the use of that technology. It could be used to watch movies, listen to music, download files, chat with loved ones, seek support service, access health information and chat with health professionals online as stated earlier on. This expedition will actually influence the use of the technology.

CHAPTER FOUR

THE RESEARCH METHODOLOGY

4.0. Introduction

This section is about how the whole research process was planned and carried out, that is detailing the entire research process. The section gives an overview and a brief profile of Ghana, where the study site is located as well as the profile of the research setting itself. It also describes the research approach and design, the data collection method, the procedure for data collection, the tool and the data analysis strategy.

4.1.0. Research Setting

This section of the methodology relates to the description of the setting where the study was carried out starting from the broader area, narrowing it down to the specific site.

4.1.1. The profile of Ghana

The study was carried out in Ghana, among the students at the University of Ghana. Ghana is an English speaking country, formerly known as the Gold Coast because of an abundance of Gold. It is geographically sited on the Gulf of Guinea in the south of the West African sub-region. It shares borders with the Republic of Togo in the east, the Ivory Coast on the west and Burkina Faso in the north. Accra is the capital town of Ghana.

Ghana is blessed with about 46 different spoken languages, with English as the official language. Ghana occupies a geographical area of 92,100sq miles (238.533sq kilometers) and homes about 24,685,823 million people (Ghana Statistical service, 2012).

Climatically, Ghana has two major seasons; the rainy season and the dry season. The rainy season covers the months from April to August, and during September to March, the dry season (Ghana Statistical service, 2012).

Politically, Ghana is divided into 10 regions, 138 districts and 275 constituencies. As a multiparty democratic state, the highest office is occupied by the President, followed the Vice President (the executive arm of Government), the Speaker of Parliament (a legislative arm of 34 Governments) and the Chief Justice (a judicial arm of Government). Members are also elected from each constituency to form the legislative arm of Government.

Ghana is a lower middle-income country that is naturally blessed with gold, timber, industrial diamond, bauxite, manganese and petroleum among other natural resources.

The vegetation of the country's land is tropical and partly savannah. Hence, the majority of the workforce is in agriculture. Agriculture in Ghana accounts for about one-quarter of the Gross Domestic Product (GDP) and employs more than half of the entire workforce, mainly small landholders. The service sector accounts for 50% of the GDP. The total expenditure on health per capita is 106 dollars and the total expenditure on health as a percentage of GDP (2012) is 5.2 (CIA, 2014). The current GDP of Ghana is 47.93 billion dollars (World Bank, 2014)

4.1.2. Health Care Delivery in Ghana

Healthcare delivery in Ghana is provided by different stakeholders, namely the Government, religious bodies and private individuals or institutions. The Ministry of Health (MOH) and The Ghana Health Service (GHS) are the major legal institutions responsible for regulating health care practices in Ghana. Currently, health care in Ghana is mainly financed by the National Health Insurance Scheme (NHIS). It is, however a requisite for citizens to register with the NHIS authority in order to enjoy the full benefits offered by the scheme. Even though all Government health institutions and some private and mission-based deliver health services on the scheme, accessing health services from some other private and mission-based

institutions are based on "cash and carry system". Moreover, among some institutions that run the NHIS, not all medical or surgical procedures are covered by the scheme.

The health care system operates on a tiered system with five levels: community, sub-district, district, regional and national levels (MOH-Ghana, 2008).

A report on the health sector of Ghana in 2010 revealed that there were about 343 hospitals; 156 were privately owned, 96 Government owned, 69 owned by religious bodies and 22 by the Quasi-Government (partly Government, partly Privatized) (GHS, 2010). There were also 11 polyclinics, 2,083 health centers and clinics, 389 maternity homes, all distributed across the country (Ghana Health Service, 2010).

For the number of healthcare professionals across the country, the Ghana Health Service report further revealed that, in 2008, there were 1,880 medical officers, 31 dental surgeons, 1,129 pharmacists and 9,775 professional nurses (Ghana Health Service, 2010).

The proportion between the healthcare professionals and the entire population of its citizenry; a total population of 25.90 million people (World bank, 2014) is an indication of a low ratio of health professionals to the population. For instance, the doctor to population ratio was 1:10,034 whilst the nurse to population ratio was 1:1,240 in 2011 (Ghana Health Service, 2011).

There is also a challenge with unequal distribution of healthcare professionals. Health centers in the urban regions like the teaching hospitals are stocked with more qualified health professionals, to the detriment of the rural areas. It is also not unusual for patients to be transported to these well-stocked centers before they can access medical care. These developments can go a long way to compromise on the quality of care and services provided to the general population.

4.2.0. The Research Site

The research was conducted among students (Nursing and others) at the University of Ghana. This is because the University of Ghana is one of the public universities that have most of the basic infrastructures needed in educating students put in place. E.g. students' accommodation, adequate lecture halls, computers, Internet access and a library, which make education comfortable. It is mandatory to apply for admission and do semester registrations via the Internet. As such, it runs a computer driving license program to add up and equip all students with basic knowledge in Information and Communication Technology e.g. Microsoft word, excel, power point and access.

 In addition to this, the University of Ghana is located in Legon, Accra. I used to work in this area and as such, my familiarity and practical aspect of logistics makes the location a convenient and suitable place for this study.

4.2.1. Scope of the University

The University of Ghana is the first and one of the six public universities in the country that offer both undergraduate and postgraduate programs. It is affiliated with the Association of Commonwealth Universities (ACU) and the Association of African Universities (AAU).

The University of Ghana was founded in 1948 as the University College of the Gold Coast, on the recommendation of the Asquith Commission on Higher Education, in the then British colonies. The Asquith Commission, which was set up in 1943 to investigate Higher Education, recommended among other things, the setting up of University Colleges in association with the University of London. The University is mainly based at Legon, about 12 kilometers northeast of the center of Accra, the capital city.

The University currently has four colleges: the college of Health Science (school of Nursing), the college of Basic and Applied Sciences, the college of Humanities, and the college of Education. The University has about 33 Schools and Faculties offering both undergraduate

and post-graduate courses. The University can also boast of a hospital and a clinic that attends to the health needs of its students and staff.

The University of Ghana currently has five main traditional halls and these are: Legon, Akuafo, Volta, Commonwealth, and Mensah-Sarbah. However, the University also has other hostels that support in accommodating its students. The University has a student population of about 29,754, which comprises of both undergraduates and postgraduate students (www.ug.edu.gh).

4.2.2. Nursing School, University of Ghana

The study was conducted using selected students from the School of Nursing and other departments. The majority of the participants were from the School of Nursing. The School of Nursing under the college of Health sciences at the University of Ghana was initially established as a Post Basic Nursing institution in 1963 as a World Health Organization project (WHO) under the auspices of the Ministry of Health.

However, in 2003, the then Department of Nursing was officially upgraded into a school and made a constituent of the College of Health Sciences. The school has five Departments comprising mental health, community health, maternal and child health, adult health and research, education and administration. The school offers both undergraduate and graduate degree programs. It currently has a total student population of about 500.

Figure 8. **An image of the entrance to the University of Ghana.**

Figure 9. **An Image of the Nursing School, University of Ghana**

Figure 10. **An image of the Balm Library, where nursing students converge to board buses for their clinical practice.**

Figure 11. **An image of the researcher and his team, waiting for the students to board their buses**

4.3. Ethical Considerations and Permissions

Before the commencement of the study, a research protocol was developed and sent to my supervisor in my Department at the University of Tromsø for departmental approval. After gaining the approval from the Department, the research protocol was forwarded to the Ethical Review Committee, Noguchi Memorial Institute for Medical Research (NMIMR) at the University of Ghana, for ethical clearance.

After the acquisition of the ethical clearance from the committee, recommendations made were adhered to. The purpose of the study was made known to the participants and procedure explained. No participant was coerced or unduly influenced to participate or continue to participate in the study. They were also informed that they reserved the right to withdraw from the study at any point in time. The participants were also assured that this research is for academic purpose. Also, any information received would be kept as confidential. The names and contacts of participants were not requested to ensure anonymity.

4.4.0. Research Design

The study is a cross-sectional descriptive study, i.e. a type of study that has no control over the exposure of interest. However, unlike the other research designs, descriptive research enables the researcher to inquire into a particular issue of current concern, usually undertaken by those involved with the main aim of implementing a change in a specific situation (Creswell, 1994). I hope that this technique will enable the study to get detailed information on how students use the Internet for health purposes.

A structured and close-ended questionnaire was designed and administered to participants. This was to ensure that the questions were easier and quicker for respondents to answer. And also, using this type of questions made answers easier to code and statically analyze.

The convenient sampling technique was also employed in administering the questionnaires to gather the needed data. This technique was employed because of the easy access and availability of the target group, with which data can be gathered. It also offers every student in the identified population, the opportunity to take part in this study and also decrease issues associated with bias.

4.4.1. Research Method

In the field of research, there are two major applicable methods depending on how and what the researcher is investigating. These methods are the quantitative and qualitative/interpretive. In conducting my research, the quantitative method was applied due to its ability to create evidence which can be tested and retested for its validity and reliability by different sets of researchers from any part of the world. This method allows for the gathering of larger amounts of data and offers a precise reporting of accrued results (Wimmer and Domick, 2011).

In order to gain experience and understand the focus of my study, a one-month field trip was taken to Accra, Ghana. Upon the acquisition of the ethical clearance from the Ethical Review Board at the Noguchi Memorial Institute for Medical Research, University of Ghana, I recruited five graduates from the same university, who had good insight and understanding of research to assist in the administering of my questionnaires. After a day of training, we went straight into the field to gather the data.

Initially, the plan during the proposal stage of the study was to visit, the participants in their respective hostels and administer the questionnaires, but upon entering the field and doing a preliminary testing, I noticed that most of the students had different time schedules 24/7. And in order to get reliable participants in my study, I needed to get students with almost the same

time schedule. I therefore decided to use the nursing students as my target at the nursing school since, they had the same timetable/ schedule.

I visited the School of Nursing and made inquiries as to when it was appropriate to come in and administer my questionnaires. I was advised by a staff of the school that the students were having their clinical practice in different hospitals across the city. Since it was not possible to visit these hospitals one after the other in search of participants, it was prudent to meet the students at the converging point before they pick the buses to their respective hospitals of affiliation. I adhered to the advice offered by the member of staff because it sounded realistic and above all, my time was also limited.

At the University of Ghana campus, a convenient sampling technique was employed in gathering the data. The identified participants were met at their converging point where nursing students from first year to final year meet to join buses to their designated hospitals; Korle Teaching Hospital, 37 Military Hospital, Ridge Hospital and the Accra Psychiatric Hospital for their clinical practice. The team of data collectors was divided and each joined a bus to a respective hospital to administer the questionnaire after seeking consent from all the bus drivers.

On the bus, the purpose of the study was explained to the identified participants. Participants were made to understand that participating in this study was solely on a voluntary basis and that they also reserved every right not to take part in the study. Hence, questionnaires were given to only students who were willing to take part in the study voluntarily. Those who were reluctant were exempted from taking part. No participant was coerced or unduly influenced to participate or continue to participate in the study.

On the other hand, the research team also gave out questionnaires randomly to other students, who were around the converging site whilst waiting for the nursing students. This was done purposely to monitor if there was any significant differences in the use of the Internet for

health purposes between the two categories of students (nursing students and other students) and to ascertain whether the program of study had an impact on the students' use of the Internet.

4.4.2. Study Population

During the data collection process, it was important to have representatives from all the levels. That is from level 100 to 400. This was so because I wanted to also find out if the educational level of the participants also had an influence on the use of the Internet for health purposes. As such, out of the 29,574 student population, I chose to focus on the 500 students at the School of Nursing as my sample size. This was because I had to take into consideration a number of factors, including the huge size of the student population, with diverse programs of study and the availability of these students.

4.4.3. Selection of the Participants

The nursing students were identified as my prime target group for the purpose of availability and as an alumni, it was easy reaching out to them. After the team explained the purpose of the study to the identified population, students who voluntarily offered to take part in the study were included and given a questionnaire to fill out. And those who were reluctant to take part in the study were not coerced or forced. Hence, they were excluded from the study and no questionnaires given to them to fill. Also, the other students who were at the premises while the research team was waiting for the nursing students were subjected to the same protocol.

4.5. Data Collection

The tool used for the data collection was a designed, structured and close-ended questionnaire, which was validated by testing it among my colleagues before administering it to the participants. Data were gathered from participants who have volunteered and were willing to take part in the study after observing all the ethical considerations and recommendations from the ethical committee at the University of Ghana.

The data gathered included demographic data, the availability of Internet on campus and off campus for participants, use of the Internet, devices used in accessing the Internet, and reasons for using the Internet. All these data were collected anonymously as names, addresses, and contacts of the participants were not collected.

A total of 363 students participated in the study and filled out the questionnaires. The nursing students filled 263 questionnaires while the other students completed 110.

4.6. The Questionnaire

In order to amass the needed data, I chose to use a questionnaire. A questionnaire is simply a tool made up of a list of orderly questions purposely for collecting and recording information about a particular issue identified to be of interest to a researcher. It affords the researcher an increased speed and accuracy of recording and also help to facilitate data processing.

Before the design of the questionnaire, I reviewed some literature on how to design a user acceptance questionnaire and also had a discussion with my supervisor for his guidance. We then settled on coming up with closed ended questionnaires. This kind of questions was chosen because it makes the data easy to quantify and categorize the response given by the participants from a large group. The closed ended questionnaires did not coerce the participants to provide a unique or unanticipated response, but instead, directed them to choose from a pool of pre-selected options. It is like being offered fruits, cake or coffee

during a conference break instead of being asked "what would you like for your conference break?".

As such, our questions were structured using 7 main structured closed ended questions with its pool of options (responses) to choose from and 1 question which allowed respondents say anything in relation to the above questions. The questions had the following headings below.

1. Demographic Data

2. Use of the Internet

3. How often do you use the Internet for health purposes?

4. Why do you use the Internet for health purposes?

5. Have you used any of these as sources for health information?

6. Based on the information sourced from the Internet, what did you do?

7. What was your reaction after sourcing the health information?

8. Do you have anything else to say in relation to the above questions?

Justifying the above questions, we sought demographic data such as the age, sex and level of education from the participants in order to find out if demographic variables were of importance to participants' use of the Internet for health purposes. Hypothetically, the level of education should influence a participant to perceive the (Internet) technology to be useful based on the fact the University runs a computer driving license program for its students which makes use of the technology in question.

Also, when it came to the use of the Internet, we wanted to find out if the participants' level of experience in using the Internet had any influence on using it for health purposes. This led us to probe deeper to find out other reasons for using the Internet.

In order to keep the participants on track, I asked questions to find out if they had been using the Internet to read health information, interact with their doctors, or seek for social support

online. I also provided them with a list of sources (apps, search engines, social media and video services) used in accessing health information online as I wanted to establish the various platforms used in carrying out these activities.

And also I had investigated the users' line of action after searching for health information online to determine if their health behavior pattern got changed. As such, we also provided them with a list of responses to choose from. And then finally, we asked if the participants had anything to say in relation to the questions asked.

4.7. Data analysis strategy

To analyze the gathered data, the Statistical Package for Social Sciences (SPSS) 22 was used. Descriptive statistics (e.g., table, percentages) were used to summarize and categorize the data, while chi square tests will be used in the comparison of the two groups of students.

5.0. Introduction

The questionnaires were administered and all data gathered in the month of August, 2014. The total number of questionnaires administered to the participants and retrieved amounted to 363. The majority of the students asked to take part in the study did so. All items in the questionnaires were also answered.

The following demographic data were collected from the respondents: age, sex, educational level, program of study, residential status, and hall of residence. Out of the 363 respondents, 253 (69.7%) were nursing students and 110 (30.3%) were other types of students. 151 (41.6%) were male and 212 (58.4%) female, as presented in Table 1 below.

Table 1. Program of study and sex of respondents

Program of study	Frequency	Percentages %
Nursing	253	69.7
Other students	110	30.3
Total	363	100
Sex	**Frequency**	**Percentage**
Male	151	41.6
Female	212	58.4
Total	363	100

Source: Field Survey (2014)

As many as 241 (66.4%) of total respondents were within the age bracket 20-24 years, 48 (13.2%) were within the age bracket of 25-29 years, 33 (9.1%) were within the range of 30-34 years, and 29 (8%) were 35 years or above. The smallest age group in terms of respondents was the group less than 20 years, which had 12 (3.3%) respondents.

Also, 50 (13.7%) of the respondents were at level 100, 96 (26.4%) were at level 200, while

112 (30.9%) and 105 (29%) were at levels 300 & 400, respectively.

Table 2. **Age groups and educational levels of respondents**

Age	Frequency	Percentage
Less than 20 years	12	3.3
20-24 years	241	66.4
25-29 years	48	13.2
30-34 years	33	9.1
35 and above	29	8
Total	363	100
Level	Frequency	Percentage
100	50	13.7
200	96	26.4
300	112	30.9
400	105	29
Total	363	100

Source: Field Survey (2014)

5.1. Research Question One: How often do the students use the Internet for health purposes?

To find the answer to this question, item No. 2i, 2ii, 3i, 3ii, 3iii on the questionnaire (Have

you used the Internet before? How many times in the last 7 days? How often do you use the

Internet to interact with health professionals they had met face to face, participate in forums

or self groups (focusing on health and illness), read about health and illness?) proved helpful.

From the data gathered, all 363 (100%) respondents, both nursing students and other students

acknowledged using the Internet before. 30 (8.3%) respondents had used it once in the last 7

days, 40 (11%) twice, and, 293 (80.7%) had used it three or more times.

More so, 161 (44.4%) out of the 363 respondents indicated that they had used the Internet to

interact with health professionals face to face whilst the remaining 202 (55.6%) respondents

stated otherwise. Out of the 161 respondents who had interacted with health professionals on

the Internet, 19 acknowledged having done so on a weekly basis, 59, monthly and 83, more seldom.

On the question of participating in forums or self-help groups (focusing on health and illness), 214 (59%) out of the 363 respondents indicated that they had never used the Internet in that regard. However, the remaining 149 (41%) respondents acknowledged using the Internet to participate in forums or self-help groups. 14 had done so weekly, 53 monthly, and 82 more seldom.

On the subject of reading about health and illness, 358 (98.6%) respondents stated that they had used the Internet for that purpose whilst the remaining 5 (1.4%) indicated otherwise. The usage was as follows; 228 (weekly), 63 (monthly), 67 (More seldom) and 5 (never).

5.2. Research Question Two: By what means do the students access the Internet for health purposes?

In order to answer the above question, item 2iii on the questionnaire was used to generate the needed response. The majority of the respondents (247, 68%), comprising of both nursing students and the other students, had used smart phones in accessing the Internet for health purposes. This was followed by the use of laptops (69, 19%), tablets (41, 11.3%), and desktop computers (6, 1.7%).

5.3. Research Question Three: Does the availability and accessibility to the Internet influence users' use for health purposes?

In order to answer the above question, items 2v, 2vi, and 3i, 3ii, 3ii in the questionnaire were used. The data showed that nearly all the respondents (361, 99.4%) owned one or more devices (Smartphone, laptop, tablet or desktop computer) by which they could access the Internet. 269 (74.1%) of the 363 had access to the Internet in their hall of residence.

5.4. Research Question Four: What are the students' reasons for the use of the Internet for health purposes? To answer this very research question, items 4i, 4ii and 4iii from the questionnaire were used. From the collected data, 339 respondents (nursing students and other students) claimed to have used the Internet to purposely find information that can help them decide whether to consult a health professional. 38 respondents stated they were using it Always, 125 Often, and 176 Sometimes. However, 24 respondents claimed Never to have done so.

In another item, 308 (84.8%) out of the 363 respondents (nursing students and other students) indicated that they had used the Internet to find health information prior to an appointment. Also, 313 (86%) out of 363 respondents acknowledged using the Internet to purposely search for health information after an appointment with their health professional. 70 respondents indicated using it Always, 114 Often and 129 Sometimes.

5.5. Research Question Five: What are the perceived outcomes of using the Internet for health purposes? To address this question, items 6i to 6vi, and 7i to 7iv in the questionnaire were used.

I asked the students how they had reacted after having used the Internet for health purposes. 102 (28.1%) students had made, changed or cancelled an appointment with their doctor, while 261 (71.9%) had not. 168 (46.3%) had discussed the information with their doctor, while 195 (53.7%) had not. 32 (8.8%) had changed their medication without discussing it with their doctor, while 331 (91.2%) had not. 109 (30%) had questioned the diagnosis made by their doctors, while 254 (70%) had not. 116 (32%) had questioned the treatment given by their doctors, while 247 (68%) had not. 280 (77.1%) had changed their lifestyles, while 83 (22.9%) had not. 40 (11%) had felt anxious, while 323 (89%) had not. 320 (88.2%) had felt

comfortable, while 43 (11.8%) had not. 357 (98.3%) had felt more knowledgeable, while 6 (1.7%) had not. 11 (3%) had felt more confused, while 352 (97%) had not.

5.6. Differences between the nursing students and the other students

In an attempt to present some differences between the nursing students and the other students, finding have been grouped under Reasons for using the Internet and Perceived outcomes.

Reasons for using the Internet

The data revealed that while 128 of the nursing students (50.6%) had used the Internet to interact with health professionals they had met before (15 weekly, 50 monthly, 63 more seldom), this was the case with 33 (30%) of the other students (4 weekly, 9 monthly, 20 more seldom) (Chi-square test, $p<0.01$). 119 (47.0%) of the nursing students had participated in forums or self-help groups (10 weekly, 45 monthly, 64 more seldom), while this was the case with 30 (27.3%) of the other students (4 weekly, 8 monthly, 18 more seldom) (Chi-square test, $p<0.01$). Nearly all the students had used the Internet to read about health or illness: 250 (98.8%) of the nursing students and 108 (98.2%) of the other students.

The data also revealed that while 242 (95.7%) out of 253 nursing students had used the Internet to find information that can help decide whether to consult a health professional (31, Always; 106, often; 105, sometimes), this was the case with the other students, 97 (88.2%) out of 110 (7, Always; 19, often; 71, sometimes). Chi square test ($p< 0.01$).

Out of 253 nursing students, 230 (91%) also acknowledged using the Internet to find health information prior to an appointment with their doctors (39, Always; 81, often; 110, sometimes), while among the other students; 78 (71%) out of 110 indicated usage (4, Always; 12, often; 62, sometimes). Chi square test ($p< 0.01$).

Furthermore, finding health information after an appointment with a health care professional, the data indicated that 233 (92.1%) of the nursing students had done so (68, always; 94, often; 71, sometimes) while in the case with the other students, it was 80 (72.7%) (2, Alway; 20, often; 58, sometimes;). Chi square test (P< 0.01).

The quest for searching for health information online using search engines such as google, Bing and Yahoo, revealed some interesting results. The data suggested that nearly all respondents from both categories had used it. Among the nursing students, 250 (98.8%) respondents claimed to have used it while the other students, 108 (98.2%). Also responding to the question of using Social media, such as Facebook and Twitter in search of health information, 148 (58.5%) nursing students indicated usage, while among the other students, 57 (51.8%).

In an attempt to assess respondent's next line of action after searching for health information online, a set of questions was asked. From the data, it was revealed that out of the 253 nursing students, 88 (34.8%) had made, cancel or change appointment with the doctor, while in the case with the other students, 14 (12.7%). Also, 138 (54.6%) of the nursing students had discussed the health information gathered with their doctors and among the other students, 30 (27.3%). Chi square test (P<0.01).

95 (37.6%) out of the 253 Nursing students, claimed that they had questioned the treatment given by their doctors while in the case of the other students, 21 (19.1%). (Chi square test, P<0.01). While 92 (36.4%) Nursing students also stated that they had questioned the diagnosis made by their doctors, this was the case of the other students, 17 (15.5%). (Chi square test, P<0.01).

As a result of being exposed to health information online, 17 (6.7%) of the nursing students indicated that they had changed their medication, without discussing it with their doctor, and among the other students, 15 (13.6%). Furthermore, among the nursing students, 211 (83.4%)

claimed that they had changed lifestyle as a result of the health information accessed online, while in the case of the other students, 69 (62.7%).

Perceived outcomes

Touching on the perceived outcomes associated with the use of the Internet in searching for health information, only 18 (7.1%), out of the 253 nursing students indicated that they felt anxious, while in the case of the other students 22 (20%) out of 110. Chi square test (P<0.01). While 233 (92.1%) nursing students and 87 (79.1%) other students, claimed they had felt comfortable, nearly all the students stated that they had felt more knowledgeable, with Nursing students recording 249 (98.4%) and the other students, 108 (98.2%). However, 9 (3.6%) nursing students acknowledged feeling more confused, while among the other students, 2 (1.8%).

All the findings above, suggest that the type or program of study (nursing vs. other) is of importance to how the students use of the Internet for health purposes, i.e. the participation in self-help groups or forums and interacting with health professionals they had met before.

CHAPTER SIX

DISCUSSION

6.0. Introduction

The current chapter aims at discussing and describing the objectives of the study in relation to the findings acquired. I further intend to discuss some probable reasons as to why this study yielded such responses. I would also discuss my theoretical model in relation to my findings and some limitations, including recommendations.

By law, every Ghanaian qualifies for access to basic health services. However, the current health system and the efforts of the government and stakeholders, have not met this goal. The obstacles to achieving this goal include the limited number of health professionals to citizen ratio, misappropriation of funds and brain drain (migration of health professionals to developed countries).

The aim of this study, therefore, was to assess the use of the Internet for health purposes among students at the University of Ghana. And also make recommendations to the stakeholders involved in the health industry of Ghana on the possible use of the Internet in providing some basic health services. The findings from the study will also add to the existing knowledge in the field.

Unexpectedly, this study has yielded some interesting findings. The data gathered, revealed that all 363 (100%) respondents were using the Internet for health purposes. Also, the majority of respondents claimed they owned two or more devices, which they use in accessing the Internet. Furthermore, respondents pointed out that they had interacted with their health professionals through social media platforms using software applications such as WhatsApp and Facebook despite having knowledge of confidentiality issues.

I chose to do a descriptive study simply because of the kind of research questions I wanted answers to. In order to achieve this, a convenient sampling technique was employed as it afforded me the chance to get to my research target group. This was also because diverse groups of students at the University of Ghana. Although they might be pursing same programs, they have different elective subjects and different lecture halls. This makes it difficult to track students. However, in the case of the nursing students, they all did the same program and elective subjects, making it easy to reach out to them. Hence, the choice of my research target group and the sampling technique employed. In an attempt to gather the needed data, a tailored questionnaire was designed purposely for the study.

The findings from the undertaken study has enlightened us about the degree to which the Internet is being used for health purposes among students in Ghana, using the students at the University of Ghana as a reference group. The objectives of the study in relation to the findings gathered have been discussed below.

6.1. The extent of Internet use among students for health purposes.

From the findings, the use of the Internet for Health purposes among students at the University of Ghana is quite shocking. The data collected, revealed a higher increase in usage than expected. It even revealed a 100% response rate. That is, all the 363 students who took part in the study, answered their questionnaires. The respondents also acknowledged that they had used the Internet for health purposes. The majority of the respondents, 293 (80.7%) stated that they had used the Internet for such purposes 3 to 4 times in a week. What makes these findings shocking, is the fact that Ghana is considered one of the developing countries in the world and even struggling to provide the basic source of drinking water for some of its citizenry (Lazuta, 2013). However, the Internet is available and being used for exploits.

Comparing my findings to studies carried out on other continents with good economies like Europe and America, where there are a lot of people using the Internet (see Figure 1), no study upon my search has indicated a 100% usage for health purposes. However, Siliquini et al. (2011) indicated in their study conducted in Italy, that out of 3018 respondents, 1,720 (57%) acknowledged using the Internet for Health purposes. Andreassen et al. (2007) also indicated in their study from a survey carried out in Norway, Denmark, Germany, Greece, Poland, Portugal and Latvia that out of 7903 respondents, 4,906 were Internet users. Out of the 4,906 (62.1%) Internet users, 3,483 (71%) had used it for health purposes.

In another study conducted in the UK by Ayantunde, Welch and Parsons (2007), 289 (42%) out of the 688 respondents claimed to have used the Internet for Health purposes.

In America, Escoffery et al. (2005) reported that out of 743 undergraduate students surveyed from two different universities, 550 (74%) stated that they had used the Internet for health purposes. Fortson et al. (2007) also pointed out that 90% of their students surveyed had used the Internet for health purposes.

Making reference to the UTAUT proposed by Venkatesh et al. (2003), which served as a theoretical framework for my study, the higher percentage rate of Internet use associated with students at the University of Ghana could be attributed to a list of factors. As the UTAUT puts it; in order to witness actual system usage, users ought to have been influenced by a number of factors including; Performance expectancy (perceived usefulness of the technology), effort expectancy (Perceived ease of use), facilitating conditions (availability or provision of Internet access on campus, the knowledge, skill and means of accessing it) and social influence (insurgency of various social media platforms).

The factors outlined by the UTAUT, could be narrowed down, paying tribute to the free Internet connections on the campus and the fact that bundling Internet data for going online in

Ghana is cheap. As such, a Smartphone user could bundle an Internet data, worth $10 and use it for more than one week when the provided Internet connection on campus is not working. Another factor is the successful introduction of the ICT in the educational curriculum of Ghana and the running of the computer driving license program, which may have equipped these students with the needed skills in using the Internet for health purposes.

6.2. The means by which students use the Internet for health purposes

In relation to the above objective, I wanted to unearth the means through which these students were accessing the Internet. The study revealed that nearly all the respondents (361, 99.4%) owned electronic devices such as Desktop computers, laptops, iPads and smart phones, which they used in accessing the Internet for health purposes. The majority of these students even owned more than two of the above devices. The results may suggest that even though the country might be poor, the majority of these students come from middle class homes and so are not poor. This is because, in order to put a student through a university in Ghana, the parents have to be middle-income earners. The results could also suggest that these students have embraced the Internet and its usefulness hence the acquisition of such devices.

6.3. The influence of the availability and accessibility of the Internet on users use for health purposes

In order to achieve this objective, item number 2v, 2vi, and 3i, 3ii, 3ii in the questionnaire were used. Even though Ghana experienced the commercialization of the Internet in the early part of 1995, it took some years for people to fully embrace it. On the issue of availability and accessibility to the Internet, all 363 respondents stated that they access to the Internet. This finding affirms what Lazuta, (2013) asserted in her submission, that more people in Ghana have access to the Internet than to a source of clean drinking water.

The data also showed that out of all the 363 respondents, 361 (99.4%) owned one or more devices (Smartphone, laptop, tablet or desktop computer) which they had used to access the Internet. This finding may suggest that if people have the right devices for accessing the Internet and can find Internet in all corners of the country, at least those who have the required skills for surfing the Net could use it for health purposes.

6.4. Reasons for the use of Internet for health purposes

According to Cline and Haynes (2001), the Internet could be beneficial to users in three primary ways, with respect to their health needs; searching for health information directly online, participating in support groups and consulting with health professionals.

The data showed that 161 (44.4%) out of the 363 respondents had interacted with health professionals they had met face to face on social media platform using applications such as, *WhatsApp* and *Facebook*. 19 claimed that they did so on a weekly basis, 59, monthly and 83, more seldom. One major question that might boggle the mind of people across the globe is why health professionals would also interact with these students through the social media considering the doctor patient confidentialities and legalities.

I think that the explanation for this is linked to the perceived ease of use and the usefulness of the technology as expounded by Davis (1989). The doctors and other health professionals have also embraced the use of these technologies in their work practices. This is because they might have perceived the Internet to be very useful and easy to use. As confirmed by Mansfield et al. (2011), physicians are also increasingly using social media, both professionally and in their daily lives. Other researchers add to this by arguing that some physicians also use social media to exchange information about professional problems and clinical experiences (Hyman, Luks and, Sechrest, 2012; Anikeeva and Bywood, 2013).

The use of social media has become the order of the day in Ghana. The majority of the people in the country, both the educated and the uneducated, have accepted it and have been using it purposely to interact with friends, colleagues, families or loved ones. This wide usage can be attributed to the fact that data charged for using social media applications are very low and cheap. The applications, mostly used include WhatsApp, Facebook, Viber, and Skype.

According to Brockman, Christakis and Moreno (2014), some users also use social networking platforms such as Facebook, Twitter and WhatsApp, as a place for making health research. Many respondents in my study affirmed this, by stating that they had used WhatsApp and Facebook to interact with health professionals to seek for health advice.

The students in question got in touch with health professionals who provided them with their names and contact details after meeting up face-to-face with them and establishing the rapport. In order to facilitate an interaction between the students and the health professionals, it is imperative that these applications are installed on both of their devices used in accessing the Internet. When granted the particulars of the health professional, these students search and send them a friend request on Facebook. The health professional can decline or accept the request based on the fact that they recognize the accompanying name and a picture of the one making the request. Upon accepting their request for friendship, both the student and the health professional gain access to communicate or interact through that platform. They can make direct calls or send messages using the Facebook application.

In the case of the WhatsApp, what a user requires is the mobile phone number of the health professional. This is very difficult to acquire, but not impossible. However, when a health professional issues out his or her phone number to these students on account of acquaintance, the application automatically links the students to the doctor after saving his/her number on the device. This application also permits users to call directly or send messages, including still images and videos. For instance, a student can take a picture of a lesion or an abscess and

forward it to his or her doctors for consultation. Provided the doctor has the application installed on his device and an Internet connection. This finding also affirms what Brockman, Christakis and Moreno (2014) expressed in their work, that some users use social networking platforms such as Facebook and WhatsApp as a place for making health research and consultations.

I think that this way of interacting with a health professional through the use of the Internet is a good one. This is because in Ghana, it is an established fact that there is a very limited number of health professionals. As such, providing basic health services to most Ghanaians is a challenge. The findings from the study suggest that there is a high possibility to access a health professional through the Internet, using a social media platform. It may also imply that it is now possible to access a health professional if a user has their contact details, owns a device capable of accessing the Internet, and has an Internet connection, provided the health professionals also meet these requirements. However, I must reiterate that there are laws governing patient doctor confidentiality in the country, but these laws might not be as strict as compared to the laws in Europe and America.

Also, one major reason for using the Internet by the respondents was to search for health information online. 358 (98.6%) out of 363 respondents did so using search engines such as Google, Bing, and Yahoo. The high usage could be attributed to the fact the Internet may offer users some privacy and anonymity (Gabarron, et al., 2012) which in return may motivate people to use the Internet to find information regarding conditions frown upon or stigmatized in society. And as seconded by other researchers in the field, it can also offer the students tailored information (Cline and Haynes, 2001; Rice and Katz, 2001, Gabarron et al., 2012; Gabarron et al., 2014).

Furthermore, the revelation associated with the high usage also affirms Andreassen et al.'s (2006) assertion, that the Internet has been embraced and become the central source of health

information across the globe. This implies that irrespective of where a user finds him or herself, provided he has the device and an Internet connectivity, the user can access health information.

However, from the data presented, participating in forum or self groups (focusing on health and illness) achieved (149, 41%) lower numbers with regard to usage by the respondents. The majority of the respondents (214, 59%) indicated that they had not done so. This could largely be attributed to cultural differences and social stigmatization. In Ghana, there is the adage " one only gets a cure for his disease condition after selling it". It implies that you only find a solution or cure to your problem if you discuss it with others. Even with that in mind, people are not comfortable discussing their health issues publicly, hence the number of respondents using the Internet for that purpose. However, the acquired percentage is encouraging.

Still on the reasons for using the Internet for health purposes, it was also observed that the majority of the respondents, 339 (93.4%) visited the Internet in search of health information when confronted with a health issue, in order to help them decide whether they needed to see a doctor.

Other respondents also claimed that they had visited the Internet prior to and after honoring an appointment with their doctors. This helped them to ask the doctors the right questions for the right answers. And also to confirm the diagnosis made and the treatment plan recommended by these doctors. These findings are in line with what Boase et al. (2006); and Street, (2003), opined in their studies.

6.5. Perceived outcome of using the Internet for health purposes.

From the data gathered, it was deduced that 261 (71.9%) respondents out of the 363 did not make, change or cancel their appointment with their doctors. And this can also be attributed the cultural makeup in Ghana. Both in the society and the Health sector of Ghana, the doctors

are revered as the final authority in addressing health problems. That is what the doctor says is final. However, doctors are humans and so therefore subject to error. But a lot of people, both educated and non educated, including nurses, physiotherapists and pharmacists, find it difficult to challenge them. However, 109 (30%) and 116 (32%) of the respondents claimed that they were able to question the diagnosis made and treatment given by their doctors respectively, after searching for health information online. These results are indicative of the fact that in the near future, when people gets empowered and discover the potentials in using the Internet for health purposes, they can access some health information online by themselves and in addition to what their doctor says, take full control of their basic health. This would also help the government in the end to achieve its goal.

6.6. Theoretical model and Research findings

The UTAUT developed by Venkatesh *et al.,* (2003) was used as a theoretical framework for the study. It was derived from the TAM2 by Venkatesh & Davis, (2000) to assess the likelihood of success in implementing a new system or technology. It was developed using 4 core determinants of intentions and usage (facilitating conditions, social influence, effort expectancy, and performance expectancy), with up to 4 moderators of key relationships (experience, voluntariness, gender, and age) that will directly determine intention and usage behavior.

This model states that in order to actualize a system being accepted and used, the 4 core determinants of intentions and usage must interact with the 4 key moderators proposed. Deductively, this implies that people will only accept and use a new technology when they perceive the system to be useful and easy to use not forgetting the environment in which the technology is to be used. Also, their past experience in using a similar technology, their will power, sex and age will all contribute to maximizing this actualization.

Expanding on the 4 core determinants of intentions and usage as enshrined by the UTAUT model, it places perceived usefulness into a concept of **performance expectancy** and perceived ease of use into **effort expectancy**. The **social influence** is that variable which captures attitudes and influence from colleagues, leaders and company or institution cultures that forces end users to use or accept the system in question. New in this model is the determinant **facilitating conditions** for user behavior. The facilitating conditions is interpreted as how individuals believe that there are organizational and technological infrastructure in place for a system use (Venkatesh *et al.,* 2003).

Linking this model to my findings, I am qualified to argue that the students at the University of Ghana perceive the technology (the Internet) to be useful and easy to use. This perception might have been influenced by their past experience with taking ICT courses, dating back to their primary school level. And also, the use of the Internet for academic purposes right from applications for admission into the university for taking and submitting of assignments, etc. From the findings, it was also evident that the majority (241, 66.4%) of the respondents who claimed to be using the Internet for health purposes were in the bracket range of 20-24 years old and 212 (58.4%) were females. This could also suggest that both age and sex have a role to play in system usage. These are also in line with what Siliquini et al., (2011) found in their study, that age and sex were key indicators for using the Internet for health related activities.

Also, the increase in the usage of the Internet might have been influenced by the use of social media, which has become the order of the day in Ghana. The social media pose some degree of social influence on the students. Friends, colleagues at work, health professionals and family members of these students uses it. Hence, most of these students have also been obliged to use it in order to get in touch with them.

However, students who do not have a means of being on the social media platform have also been compelled to meet the needed requirements (the Internet, the device and the data)

through unimaginable means. They also use this platform to seek for advice from the health professionals whom they are acquainted with.

Furthermore, the availability of the Internet on campus, the cheap Internet data and the available personal devices for accessing the Internet provides the ideal facilitating conditions to increase the use of the Internet for health purposes.

6.7. Comparison of the Nursing students to the Other students

Data collected provided deep insight into the subject matter. Accordingly, in order to make comparison between the nursing students and the other students, this discussion has been built around the core features in my operational definition for health purposes, which refers to using the Internet to search for health information, interact with support groups or chatting with a health professional.

Revisiting the data presented in chapter 5, it was evident that while 128 of the nursing students (50.6%) had used the Internet to interact with health professionals they had met before, only 33 (30%) of the other students, claimed to have done so. The implication of this is that when it comes to interacting with health professionals, the nursing students have an upper hand. As health professional trainees they work with most of these professionals during their clinical practicum and even have some of the health professionals contacts. They can ask the questions in relation to certain conditions or treatment regime seen on the ward or taught in class. Due to this reason or the other, students with a health background are likely to use the Internet to interact with health professionals compared to other students.

Also, 119 (47.0%) out of the 253 nursing students had participated in forums or self-help groups, while this was the case with 30 (27.3%) out of the 110 other students. The low response rate could be attributed to a host of factors, including socio-cultural issues, knowledge deficit on the existence of such forums and fear of the unknown. However, users

could be sensitized on the possible benefits of participating in forums or self-help groups in an attempt to increase usage while exploring and addressing other factors contributing to the decrease in usage.

In another revelation, nearly all the students had used the Internet to read about health or illness: 250 (98.8%) of the nursing students and 108 (98.2%) of the other students. This finding is in line with what has been anticipated and expressed by Andreassen *et al.,* (2007), that is the Internet has gained ground as a central source of health information. The implication of this is that much of the health information and ongoing awareness programs could be channeled through the Internet for users to access.

On the subject of using social media (Facebook, Twitter and Watsapp) for health purposes, 148 (58.5%) nursing students indicated usage, while among the other students, 57 (51.8%). The implication for this finding is that students, irrespective of their program of study, have accepted the social media and the Internet and are exploring some of the benefits of playing in the social media arena.

The expressed findings above, suggest that the type or program of study (nursing vs. other) is of importance to how the students use of the Internet for health purposes, i.e. the participation in self-help groups or forums and interacting with health professionals they had met before.

6.8. Limitations of the study

My study had several limitations. But first and foremost, the target of the study was mostly nursing students. 253 (69.7%) respondents were from the nursing school, and the remaining respondents from the other departments. This may have affected my results since Nursing students, when given health assignments, makes research using the Internet. Hence the increase in the use of the Internet for health purposes.

Furthermore, they can be motivated to evaluate the trustworthiness on health information accessed online when they meet and interact with most health professionals in their period of clinical practice, which other students do not.

Another limitation is where the study was conducted. University of Ghana is considered to be the most prestigious university in Ghana and its students are top notched. It has therefore been showered with all the basic infrastructures, including the Internet, needed to be recognized and ranked at the international arena. Students register for courses and exam, receive information from the school and even book for medical check up online. Not all tertiary institutions in Ghana enjoy that hence, the research group might not serve as a clear representation of all tertiary students in Ghana. It is also assumed that most of the students who attend this prestigious University are from good homes and have educated parents. Hence, these students are not poor and can afford other devices to access the Internet.

Another limitation was access to the students. It was very difficult getting access to participants (other students) since most of them said that they had no time to take part in the study. This was due to the fact they have had different lecture periods and venues throughout the week. It therefore limited me to get a group that did the same program and had the same venue for lectures.

Finally, the role of the researcher as a former student of the very institution and a role model for some of the nursing students, might have influenced them in taking part of the study. Hence, I cannot also say categorically, that this study could be replicated by a different researcher in the same University.

Also, the items in the questionnaire were designed to focus solely on Internet use for health purposes. This study did not give room for other purposes aside my operational definition for health purposes.

6.9. Recommendations

From the findings, it has been deduced that the social media platform could be explored as a health promotion channel by experts and the University health directorates in providing some basic health services to students at the various tertiary institutions of the country.

Furthermore, policy makers and IT programers could also utilize this priceless information, thereby harnessing the use of this platform to create health awareness programs that will target users.

It is also important that more studies are carried out to explore the use of the Internet for health purpose among other students in several tertiary institutions in the country not necessarily students pursuing health degree programs. The comparison could be drawn from a study between 2 or 3 universities. Also, the items in the my questionnaire were designed to focus solely on Internet use for health purposes. The next time a study like this nature is conducted, consideration should be made to explore and include other health related activities.

CHAPTER SEVEN

SUMMARY AND CONCLUSION

Meeting the basic right of every Ghanaian, that is access to basic health services has been the goal of all past and the current president of Ghana. However, certain factors are serving as obstacles to achieving this goal. They include the limited number of health professionals to citizen ratio, misappropriation of funds and brain drain (migration of health professionals to Developed countries).

The aim of this study was therefore to assess the use of the Internet for health purposes among students at the University of Ghana and suggest probable alternatives to addressing this problem.

This study explored and addressed the possible use of the Internet in providing basic health services to Internet users in the country using students (363) at the University of Ghana as a reference group.

Employing the convenient sampling technique, my findings revealed that all the 363 students who took part in the study at the university were using the Internet for health purposes. Also, these students owned 2 or more sophisticated devices such as Laptops, Smartphone and iPads which were being used to access the Internet. This was surprising as most people would not consider the fact that students from such a poor country as Ghana would be able to afford the identified devices.

It must also be pointed out that there was clear evidence of usage in relation to sex and age, which other studies have expressed as key indicators for Internet use for health purposes. My study revealed that most of the users were in the age bracket 20-24. Furthermore, the majority of the users were females.

Another revelation from my findings was the fact that the majority of the users had also used the Internet to interact with health professionals through social media platforms such as

WhatsApp and Facebook. Considering the fact that there are a limited number of health professionals to patient ratio, the findings from this study is suggestive that the Internet could be exploited as an alternative in providing basic health services to users in the country.

It is in the light of this knowledge, that I submit the proposal that stakeholders, policy makers and experts in the health and communication sector of the country could use the Internet through a social media platform in offering health promotion services to the users.

Concluding, I would argue with all surety, that the Internet has come to stay among Ghanaians. And the earlier we exploit and make use of its accompanying advantages in our health sector, the better our chances of creating a viable alternative of providing basic health services to the citizens.

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9.0 APPENDICES

9.1. A SAMPLE OF THE RESEARCH QUESTIONNAIRE

QUESTIONNAIRE

The Internet as a tool, is used in all facets of human lives. It provides users with the opportunity to seek for a wide range of information on relevant issues, including health which can result in positive health behaviors. The aim of this study, therefore, is to assess the use of the internet for health purposes among students at the University of Ghana. You are therefore required to answer the questionnaires below, as best as you can. Thank you!

1. Demographic Data

> **i.** Age group: <20years ☐   20-24years ☐   25-29years ☐   30-34years ☐
> 35 and above ☐
>
> ii. Sex   M ☐   F ☐
>
> iii. Educational level: 100 ☐   200 ☐   300 ☐ 400 ☐
>
> iv. Program of study..
>
> v. Residence status: Resident ☐   Non Resident ☐
>
> vi. Hall of residence:…………………….....................................

2. Use of internet

> i. Have you used the internet before?   Yes ☐   No ☐
>
> ii. How many times in the last 7days?   Once ☐   Twice ☐   Three or more ☐
>
> iii. By what means do you access the internet?   Smartphone ☐ Laptop ☐ Tablet ☐
> Desktop computer ☐
>
> v. Do you owe any of the above devices?   Yes ☐ No ☐
>
> vi. Do you have internet in your hall of residence/hostel?   Yes ☐   No ☐
>
> vii. Do you have internet within your family home?   Yes ☐   No ☐

3. What are your reasons for using the internet?

i. Interact with health professionals you have met face to face...   Weekly ☐
Monthly ☐   More seldom ☐   Never ☐

ii. Participate in forums or self-groups (focusing on health or illness)   Weekly ☐
Monthly ☐   More seldom ☐   Never ☐

iii. Read about health and illness?   Weekly ☐   Monthly ☐   More seldom ☐
Never ☐

4. Do you use the internet to;

i. Find information that can help you decide whether to consult a health   professional?
Always ☐   Often ☐   Sometimes ☐   Never ☐

ii. Find health information prior to an appointment?   Always ☐   Often ☐
Sometimes ☐   Never ☐

iii. Find information after an appointment with a health professional?

Always ☐ Often ☐ Sometimes ☐ Never ☐

5. Have you used any of these as sources for health information?

i. Apps for smart phones and pads?   Yes ☐   No ☐

ii. Search engines such as Google, Bing and Yahoo?   Yes ☐   No ☐

iii. Social media such as Facebook and Twitter?   Yes ☐   No ☐

iv. Video services such as YouTube?   Yes ☐   No ☐

6. Based on the information sourced from the internet, what did you do?

i. Did you make, cancel or change appointment with your doctor?   Yes ☐   No ☐

ii. Did you discuss the information with your doctor?   Yes ☐   No ☐

iii. Did you change your medication if any, without discussing it with your doctor?
Yes ☐   No ☐

6. Based on the information sourced from the internet, what did you do?

iv. Did you question the diagnosis made by your Doctor?   Yes ☐   No ☐

v. Did you question the treatment given by your Doctor?   Yes ☐   No ☐

vi. Did you change your lifestyle?   Yes ☐   No ☐

7. What was your reaction after sourcing the health information?

i. Felt anxious?   Yes ☐   No ☐

ii. Felt comfortable?   Yes ☐   No ☐

iii. Felt more knowledgeable?   Yes ☐   No ☐

iv. Felt more confused?   Yes ☐   No ☐

8. Do you have anything else to say in relation to the above questions?

....

....

9.2. A COPY OF THE APPROVAL LETTER FROM THE ETHICAL REVIEW COMMITTEE

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IRB 00001276

NMIMR-IRB CPN   105/13-14

IORG 0000908

On 2nd July 2014, the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) at a full board meeting reviewed and approved your protocol titled:

TITLE OF PROTOCOL   :   **Assessing the use of internet for health purposes among students at the University of Ghana**

PRINCIPAL INVESTIGATOR   :   **Eric Kwabia, MSc Cand.**

Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.

Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.

Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.

This certificate is valid till 1st July, 2015. You are to submit annual reports for continuing review.

Signature of Chair: ....
Mrs. Chris Dadzie
(NMIMR – IRB, Chair)

cc: Professor Kwadwo Koram
      Director, Noguchi Memorial Institute
      for Medical Research, University of Ghana, Legon