



Awareness and Usage of Internet-based Health Information for Self-Care in Lagos State, Nigeria: Implications for Healthcare Improvement

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Abstract.

Objective: This work investigated Nigerians' Internet pattern usage, their awareness of, and factors influencing their use of the Internet for self-care health information, given that healthcare in the country is generally inadequate.

Methodology: A questionnaire-based assessment of 205 individuals selected randomly was carried out. Cronbach's alpha was used to determine the consistency of the constructs while SPSS was used for data analysis.

Results and Conclusion: The results indicate that 61% of the participants use the Internet for self-care and are aware of the availability of health information on the Internet. The participants also reported that they have used the Internet for communication, social networking, research and banking purposes. The results validate perceived ease of use, compatibility, Internet self-efficacy, and technical support and training as factors to consider in using the Internet for self-care.

Keywords. healthcare; Internet; Nigeria; self-care.

Introduction

The advent of Internet has brought about a change in the ways tasks are carried out and how information about different subjects is obtained. In Nigeria, there has been a steady increase in the number of people that have access to the Internet. According to a recent report of Internet World Stats, Nigeria has joined the top 20 Internet users in the world and is the first in Africa [1]. It has been observed that the Internet has become an imperative tool for disseminating health information [2]. As a result, the Medical Library Association (MLA) based in the United States of America has recommended some websites consumers can visit to access useful health information [3].

Internet-based health information has the capability to appeal to consumers with different learning styles [4]. It coalesces the expansive reach merits of mass communication channels with the persuasion features of interpersonal channels by giving room for feedbacks between the message sender and receiver [5]. It has been recommended that the Internet has greater ability than other mass media to apply principles of health behaviour [5]. Consumers can also access health information in the privacy of their homes at convenient times on the Internet [6]. Consumers want

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information about prevention, both for self-care and to participate in a more informed way in their healthcare [6]. People with the greatest health risks often have had the least access to healthcare, social services, health information, and communication technologies [7, 8]. A recent survey in the US shows that sixty to eighty (60% - 80%) percent of Americans have used the Internet to obtain health information [9]. The Internet also rivaled the physicians as the leading source of health information in January 2008 [10]. An increasing proportion of the public is using the Internet for healthcare information [11].

Nigeria has an estimated population of one hundred and forty (140,000) million and the ratio of doctors to the population is about 1 to 3,333 [12]. The density of physicians per 10, 000 population is four (4), that of dentistry is .5, 16 for nurses and midwives, and 1 for pharmaceutical personnel. According to the World Health Organization (WHO) 2010 [13] report, in Nigeria, current life expectancy is 49 years. The most common causes of death, in rank order are as follows: malaria, diarrhea, other diseases, pneumonia, prematurity, birth asphyxia, neonatal sepsis, HIV/AIDS, congenital abnormalities and injuries. In Nigeria, people die of minor illnesses that could have been prevented with simple medications and healthy lifestyles [14]. The situation however, can be different if the populace are aware of the availability of health information on the Internet and take advantage of it. Furthermore, apart from accessing health information, the Internet can be used for a plethora of other activities. It is unclear, however, what other activities Nigerians use the Internet for mainly, but various studies have shown that user adoption and system acceptance can be envisaged from behavioral intention [15-18]. Considering the foregoing, this paper provides answers to the following questions: i) Are the Internet users in Nigeria aware of the availability of health information, especially for self-care on it? ii) Although some studies have shown that Internet access, ease of use, access procedures, interface, training and support are the most crucial factors for the acceptance of new systems within some user populations [19, 20], it is unclear what factors influence Nigerian Internet users' use of the Internet for the purpose of self-care. iii) Lastly, what exactly do Nigerian Internet users use it for mainly?

The answers to these questions will help discover the extent to which the Internet can be exploited to improve healthcare delivery in the country. It will also provide a guide as to the nature of hardware and features required of health information software, for successful Internet health information access adoption among the Nigerian Internet users. Lastly, it will also guide the Internet content providers as to the nature of the contents that can be provided for maximum benefits.

1.1 Related Works

College students' patterns of Internet usage for obtaining health-related information and services was investigated in [21]. One hundred and thirty six (136) students from a university in California were involved in the study. They reported among other things that over fifty percent (50%) of the subjects in the study searched the Internet for medical information. The survey revealed that a relatively small number of participants had bought pharmaceutical products on the Internet, joined a health support group, or used e-mail to communicate with healthcare providers.

Internet access characteristics among low-income populations associated with a supplemental nutrition program were compared in [22]. They provided results from three independent studies focusing on the Internet's potential for providing nutritional

education in a low-income population. Specifically, issues of computer ownership, Internet access, and location of Internet access among those receiving assistance from the US Department of Agriculture Food and Nutrition Service's Special Supplemental Nutrition Program for Women, Infants and Children (WIC) were assessed. This was done in order to determine the extent of this population's ability to access Internet-based nutrition information. A cross-sectional design was used with data reported using frequency distributions and Chi-square ($p < .05$) analyses. A total of 2,942 WIC clients completed the questionnaire at local agencies in Michigan and Washington. Over 2/3 of participants indicated having some access to the Internet, with 50% to 63% having "easy access." The result of the survey showed that older participants were more likely to access the Internet from home or work, while younger clients were likely to access from parent's home or WIC clinic and more likely to enjoy learning from the Web, as were those who owned a computer. This study provides evidence that the Internet may be a viable means for reaching low-income populations.

A nationwide telephone survey of 12,751 American adults to determine their Internet usage in 2000 was carried out in [23]. The study reported that 6,413 of the participants claimed to be Internet users and fifty-five percent (55%) of these users were using the Web to get health or medical information. Almost fifty percent (50%) of the respondents claimed that the information obtained influenced the way they exercised and ate; seventy percent (70%) reported that the health information accessed from the Web affected their decision about how to treat a condition or an illness. Fifty percent (50%) opined that the health information got on the Web prompted them to ask a doctor new questions or get a second opinion from another doctor while twenty-eight (28%) said that their decision about whether to visit a doctor or not was influenced by the health information got.

In [24], an assessment of adolescents' use of, and attitudes toward accessing health information on the Internet was done. The study was conducted among four hundred and twelve (412) suburban New York 10th graders of diverse socio-economic and ethnic groups. The assessment reported that half of the sampled population had used the Internet for health information access and the topics mostly searched for are sexually transmitted diseases; diet, fitness and exercise; and sexual behaviour. It also reported that the adolescents found the Internet to be of high value with no significant differences related to sex, ethnicity or mother's education. For eleven (11) separate health topics, girls preferred to have information on birth control, diet and nutrition, exercise, physical abuse, sexual abuse and dating violence. However, there were differences by ethnicity for alternative medicine, but no differences based on mother's education for the value of having specific health information available on the Internet.

In [25] as cited in [24], an online survey of over three thousand two hundred (3,200) Internet users was carried out by Georgia Tech Research Corporation to determine the percentage that used the Internet for health information. It was reported that eighty-two percent (82%) had used the Internet for obtaining health information. Of this percentage, five percent (5%) used it on daily basis, fifteen percent (15%) used it on a weekly basis, twenty-three (23%) on monthly basis and thirty-nine (39%) less than once in a month. They also concluded that women and older people were more likely to report the Internet as a source for health information.

The availability and utilization of information and communication technology for accessing health information by medical professionals in Kenya was assessed in [26]. Grounded theory approach was used as an analytical tool. The research was exploratory in nature and used Kenyatta National Hospital as a case

study. The study revealed that medical professionals needed information continuously in the course of their clinical work. Clinical governance, care of patients and professional updating on the current medical practices were the main reasons for needing and seeking information. When the medical professionals needed clinical information, they turned to colleagues. Textbooks and journals were also frequently used sources of information. However, there was a substantial preference for e-searching for information from the Internet and e-journals. The findings also revealed lack of library and information services, inadequate access and use of electronic information resources and inadequate ICT skills among the medical professionals.

An evaluation of how the quality of life characteristics of the elderly in Sri Lanka was done in [27]. The work discussed how it could be achieved in a cost effective way through the use of Information and Communication Technology (ICT). An in-depth study and analysis of the recent developments in field of ICT and its penetration in developing countries especially Sri Lanka was done; special emphasis was laid on constraints and challenges in adopting ICT for the improving the quality of life of elderly. The study proposed an elders' portal as a means of involving the elderly in the growth of the society. This portal must be created in such a manner that the older persons with limited ICT literacy, limited English language capability, and limited physical movement will be able to access and use it. This portal must include services like knowledge portals in different knowledge areas, social networking facility, entertainment sites, links to e-Government services and others.

In [28], the use of Internet-based and mobile e-health tools to increase information access among cervical cancer patients in Kenya was studied. The study investigated the extent of the use of mobile phones and Internet by cervical cancer patients in accessing information related to cancer treatment and management; the characteristics of patients associated with Internet use and identified barriers faced by the patients in Internet use. The study revealed the low level use of the Internet by cervical cancer clients attending public referral facilities in Kenya. This was attributed to: lack of knowledge on how to use computers and lack of access to computers. High level of access to mobile phones was also reported by the study which concluded that there was a greater potential to Internet use through Web access via mobile phones.

2. Methods

An extensive review of previous work was carried out to ensure relevant measures were included in the survey. All constructs and measurement items were adapted from previous work. The survey instrument had three sections; section one was an introduction into the survey, section two consisted of twelve questions capturing the demography and individual's knowledge of the Internet. The last section captured each respondent's perception of the each measure. The respondents were individuals from the immediate environment of this research (convenience sampling). Two hundred and twenty (220) questionnaires were distributed in Lagos, Nigeria. However, two hundred and five (205) questionnaires were returned. This accounted for 93.18% response rate. Lagos is a microcosm of Nigeria because all ethnic groups are represented in the city. The city also serves as the commercial nerve centre of the nation. SPSS version 15-analysis software was used for the data analysis.

2.1 Research Model

Figure 1 presents the research model adopted for this work. Since attitude was dropped from the original Technological Acceptance Model (TAM) because it was found to be a weak mediator between the personal belief construct and behavioural intention [29], it is not included in this work. The acceptance of a user to adopt the Internet for healthcare is a primary factor in the acceptance of this technology [16]. The proposed model incorporates the TAM constructs, Compatibility from the Innovations Diffusions Theory (IDT) and introduces Self Efficacy and Technical support and Training. The elements of the model and hypotheses are explained below.

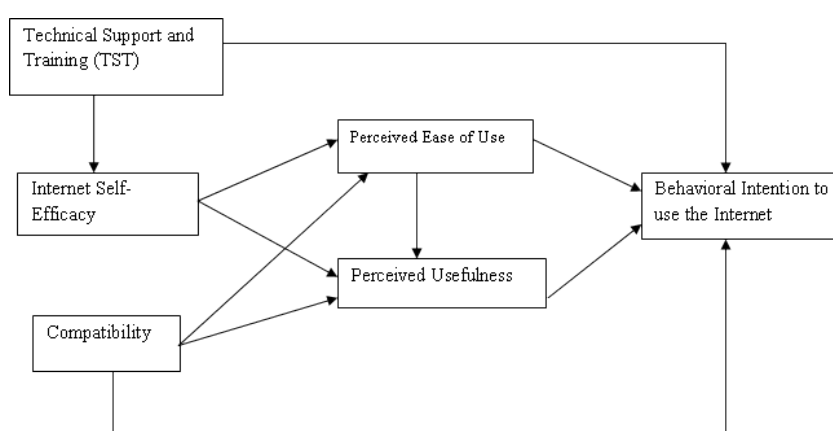


Figure 1: Proposed Research Model

Technology Acceptance Model (TAM) is a model that has been broadly used to predict and explain acceptance behaviour [30]. However, some studies have suggested the need to extend TAM to improve its explanation and prediction of acceptance behaviour [31, 32]. TAM is originally composed of five constructs: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), attitude toward using (ATU), behavioral intention to use (BI), and actual system use (AU). PU and PEOU are the most dominant determinants for system use and PEOU has a direct effect on PU. Attitude toward using directly influences a user's behavioral intention to use determining actual system use. An extended TAM, labeled TAM2 was proposed in [32], which omits attitude toward using because of weak predictors of either behavioral intention to use or actual system use. This implies that behavioural intention to use is jointly determined by PU and PEOU. This means that an individual's use of the Internet for healthcare depends on the degree to which the Internet is easy to use. TAM was tested in multimedia learning environments in [33]. From this study, it was validated that TAM and the attitude construct could be used as an assessment of students' satisfaction of using multimedia learning systems (MMLS). The results showed that PU had a significant influence on students' attitude to use MMLS. Attitude was a determining factor in the behavioural intention to use MMLS. The study brought about the validation of TAM in multimedia usage for learning and the creation of the Multimedia Acceptance Model (MAM). The individual's intentions to use the Internet for healthcare can be explained or predicted by the perception of Internet health care ease-of-use and usefulness [18]. Therefore, the correctness of previous research work carried out has led to the proposal of the following hypotheses.

H1. *Perceived usefulness has a direct effect on behavioural intention to use the Internet for self-care.*

H2a. *Perceived ease-of-use has a direct effect on behavioural intention to use the Internet for self-care*

H2b. *Perceived ease-of-use has a direct effect on perceived usefulness of the use of Internet for self-care.*

Previous research efforts have explained the strong correlation between compatibility and behavioural intention [18]. Compatibility is the degree to which the innovation is perceived to be consistent with potential user's existing values, prior experiences and needs; and it is one of the important constructs from the innovation diffusion theory. These findings have shown that the better the technology or innovation that is matched with practices, the higher the perceived ease-of-use, perceived usefulness and acceptance of it. Based on this evidence, we have the following hypotheses:

H3a. *Compatibility has a direct effect on behavioral intention to use the Internet for self-care.*

H3b. *Compatibility has a direct effect on Perceived Usefulness of the Internet for self-care.*

H3c. *Compatibility has a direct effect on Perceived Ease-of-Use of the Internet for self-care.*

A number of research efforts have also provided strong support for the relationship between an individual's self-efficacy and behavioural intention. Individuals with low confidence in their ability to use a technology or an innovation are likely to have diminished or poor intentions to use it. Self-efficacy has been studied extensively in technology adoption and acceptance [18, 32, 34, and 35]. Drawing on this, we postulate thus:

H4a. *Internet healthcare self-efficacy has a direct effect on perceived usefulness of the Internet for self-care.*

H4b. *Internet healthcare self-efficacy has a direct effect on Perceived Ease-o- Use of the Internet for self-care.*

Technical support and training (TST) is another crucial factor in IT adoption and acceptance. Theory and evidence support the need for sufficient IT support in IT acceptance [18, 32, and 36]. We have the following hypotheses:

H5a. *Technical support and training has a direct effect on the perceived usefulness of the Internet for self-care.*

H5b. *Technical support and training has a direct effect on the perceived ease-of-use of the Internet for self-care.*

H5c. *Technical support and training has a direct effect on the individual's perception of Internet self-efficacy.*

3. Results

3.1 Descriptive Statistics

The study involved a total of 205 participants comprising 108 males (52.68%) and 97 females (47.32%). The highest number of participants was in the age range 26-39. This number accounted for 42.4% of the respondents. The percentage employed was 34.1%, 27.3% were unemployed while 22.0% were self-employed. 16.6% did not indicate their employment status. From the analysis of the demographic data, 94.1% of the respondents have some level of education. It can be concluded that most of the people making use of the Internet, in general, have some level of formal education. Sixty one percent (61%) of the respondents are aware and use the Internet for self-care; 41(20%) respondents use the Internet for social networking; 82 (40%) use it for communication; and 70 (34.1%) use it for research purposes while 12 (5.9%) use it for banking purposes. 41.5% of the respondents believed that it would take a long time for the use of Internet technology for healthcare to be adopted into the Nigeria community. 55.6 % respondents believed that the use of the Internet technology for healthcare will be accepted among the Nigerian populace.

3.2 Data Validity and Reliability

The reliability of the data was measured using the Cronbach's alpha to determine the consistency of the measurement model. As shown in Table 1, the values range from 0.6 to 0.9 and the Cronbach's alpha for all the constructs has a reliability value of 0.849, which complies with the benchmark recommended [37]. The values of the validity and reliability tests prove that the data is acceptable for further statistical analysis. An initial correlation matrix was obtained from the statistical software package SPSS and is shown in Table 2. The results showed that the paths between the constructs were significant at the levels 0.01 and 0.05 except for the paths between Technical Support and Training, and Perceived Ease of Use and Self-Efficacy, which were not significant. Regression analysis was carried out on the variables that were significantly correlated. The results are presented below in Table 3.

Table 1: Constructs Reliability and Validity

Construct	Measurement Items	Cronbach's Alpha	Factor Loadings
Perceived Usefulness (PU)	1. The use of Internet in healthcare could increase health awareness. 2. The use of Internet could improve the quality of health among people. 3. The Internet could enhance the effectiveness of the physician. 4. The Internet could be useful in healthcare. 5. The Internet could make the physician's job easy	0.601	1. 0.631 2. 0.649 3. 0.647 4. 0.574 5. 0.559

Perceived Ease Of Use (PEOU)	<p>1. My interaction with the Internet would be clear and understandable.</p> <p>2. My interaction with the Internet would not need a lot of mental effort</p> <p>3. It would be easy to do anything I want to do with the Internet.</p>	0.727	<p>1. 0.800</p> <p>2. 0.808</p> <p>3. 0.818</p>
Compatibility	<p>1. The use of Internet for healthcare is compatible with my health needs.</p> <p>2. The use of the Internet for healthcare fits my work style.</p> <p>3. The use of the Internet healthcare fits my type of work.</p>	0.783	<p>1. 0.793</p> <p>2. 0.885</p> <p>3. 0.832</p>
Technical Support and Training (TST)	<p>1. A specific person or group is available for assistance with Internet healthcare activities.</p> <p>2. Specialized instruction or education concerning Internet healthcare is available to me.</p> <p>3. Specialized programs and consultants about training are available to me.</p>	0.713	<p>1. 0.812</p> <p>2. 0.788</p> <p>3. 0.803</p>
Internet Self-Efficacy	<p>1. I could complete healthcare activities using the Internet if there was no one around to tell me what to do.</p> <p>2. I could complete healthcare activities using the Internet if I had never used a system like it before</p> <p>3. I could complete healthcare activities using the Internet if I had used similar system before this one to do the same job</p>	0.641	<p>1. 0.874</p> <p>2. 0.834</p> <p>3. 0.554</p>

Behavioral Intention to Use	1. I intend to use the Internet for healthcare purposes.	0.684	1. 0.718
	2. I intend to use the Internet for healthcare sometime in the future.		2. 0.755
	3. I intend to use the Internet continuously for my work.		3. 0.840
	4. I predict that my chances of using the Internet in my field would be frequent.		4. 0.572

Table 2: Correlation Values

		PU2	PEO U3	CO MP2	TST 1	ISE 1	BI3
PU2	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	205					
PEOU3	Pearson Correlation	.057	1				
	Sig. (2-tailed)	.420					
	N	205	205				
COMP2	Pearson Correlation	.216(**)	.338(**)	1			
	Sig. (2-tailed)	.002	.000				
	N	205	205	205			
TST1	Pearson Correlation	.150(*)	.106	.420(**)	1		
	Sig. (2-tailed)	.032	.131	.000			
	N	205	205	205	205		
ISE1	Pearson Correlation	.140(*)	.524(**)	.502(**)	.373(**)	1	
	Sig. (2-tailed)	.045	.000	.000	.000		
	N	205	205	205	205	205	
BI3	Pearson Correlation	.092	.369(**)	.048	.018	.137(*)	1
	Sig. (2-tailed)	.192	.000	.491	.801	.050	
	N	205	205	205	205	205	205

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

* Correlation is significant at the 0.05 level

Table 3: Table Showing the Significance Levels and Support Level of each Hypothesis.

Hypothesis	R ²	Significance value (P<0.01, P<0.05)	Support
H1. Perceived usefulness has a direct effect on behavioural intention to use the Internet for self-care.	0.92	0.192	Not supported
H2a. Perceived ease of use has a direct effect on behavioural intention to use the Internet for self-care.	0.369	0.000	Supported at 0.01 significant level
H2b. Perceived ease of use has a direct effect on perceived usefulness of the use of Internet for self-care.	0.057	0.420	Not supported
H3a. Compatibility has a direct effect on behavioural intention to use the Internet for self-care.	0.048	0.491	Not supported
H3b. Compatibility has a direct effect on Perceived Usefulness of the Internet for self-care.	0.216	0.002	Supported at 0.01 significant level
H3c. Compatibility has a direct effect on Perceived Ease of Use of the Internet for self-care.	0.338	0.000	Supported at 0.01 significant level
H4a. Internet healthcare self-efficacy has a direct effect on perceived usefulness of the Internet for self-care.	0.140	0.045	Supported at 0.05 significant level
H4b. Internet healthcare self-efficacy has a direct effect on Perceived Ease of Use of the Internet for self-care.	0.524	0.000	Supported at 0.01 significant level
H5a. Technical support and training has a direct effect on the perceived usefulness of the Internet for self-care.	0.150	0.032	Supported at 0.05 significant level
H5b. Technical support and training has a direct effect on the perceived ease of use of the Internet for self-care.	0.106	0.131	Not supported
H5c. Technical support and training has a direct effect on the individual's perception of Internet self-efficacy.	0.373	0.000	Supported at 0.01 significant level

4. Discussion

From above, it can be deduced that perceived usefulness has a significant direct positive influence on the behavioural intention to use the Internet technology for healthcare (H1: R²=0.008, P<0.001 B=0.092). Perceived ease-of-use also has a strong direct positive influence (H2a: R²=0.136, P<0.001) and a direct positive influence (H2b: R²=0.003, P<0.05) on perceived usefulness and behavioural intention to use the Internet technology for healthcare respectively. These findings correlate with previous research works carried out by Wu et. al. in [18]. Compatibility was found to have a direct positive influence (H3a: R²=0.002, P<0.05) on perceived usefulness and a significant direct positive influence (H3b: R²=0.047, P<0.001) on perceived ease-of-use respectively. This corresponds with the research work carried out by Oh et. al. in [38] . Also, compatibility has a strong direct positive influence on the behavioural intention to use the Internet technology (H3c: R²=0.114, P<0.001). Technical support and training has a very significant direct positive influence on the behavioural intention to use the Internet technology (H4: R²=0.274, P<0.001). This is similar to the findings

in [18]. Also, self-efficacy has a direct positive influence on perceived ease-of-use (H5a: $R^2=0.023$, $P<0.001$), and a direct positive influence (H5b: $R^2=0.011$, $P<0.05$) on the behavioural intention to use the Internet technology. These are similar to findings in [39]. From the above, all proposed hypothesis are considered valid.

Even though majority of the respondents are aware of the availability of health information for self-care on the Internet and use it, more still needs to be done by the various stakeholders to sensitize the populace to make all benefit maximally from these resources. The respondents considered perceived ease-of-use, compatibility, technical support and training, Internet self-efficacy as factors to consider in using the Internet for self-care. These findings further confirm the findings from previous work. Majority of the users of the Internet have a form of formal education. Perceived ease-of-use in terms of usability of the hardware, user interfaces is a key factor. Applications that provide health information should be easy to navigate, clear to read and organized. The hardware components should be simple and it should be easy to learn its functionalities. Complex hardware should be avoided. Using the Internet for self-care should fit into the user's lifestyle. If a technology fits into one's personal lifestyle and has a possibility of enhancing it, there is a likelihood of it being adopted. Technical support and trainings should be provided. This will boost the Internet self-efficacy of users and will motivate them to use the Internet. Support includes technical consultants, training programs, even provision of resources such as wireless network infrastructure, human resources, constant power supply, and necessary information. The cost of acquiring modems and tariffs for Internet access should be affordable by all; this will make the Internet accessible to everyone. Content providers should focus their attention on providing contents that will allow Nigerians communicate, socialize, and carry out research and bank in a bid to maximize their profits.

5. Conclusion

Different research efforts have studied Internet use of different user populations for health information access and have come out with different findings. This work, however, has presented the outcomes of an investigation of Internet health information access among Nigerians, their pattern of Internet usage and the factors that influence their use of the Internet for the purpose of self-care. The results presented have implications for healthcare improvement as well as profitable Internet contents development. However, the benefits that accrue from using the Internet for self-care purpose does not rule out the place of hospitals and healthcare professionals.

References

- [1] Internet World Stats (2012). Internet Usage Statistics for Africa, <http://www.internetworldstats.com/stats1.htm>, Accessed September, 27, 2012.
- [2] Vance, K., Howe, W., & Dellavalle, R. P. (2009). Social internet sites as a source of public health information. *Dermatologic clinics*, 27(2), 133-136.
- [3] Medical Library Association (2012). For Health Consumers: "Top Ten" Most Useful Websites, Accessed from <http://www.mlanet.org/resources/medspeak/topten.html> on October 4, 2012.
- [4] Richards, B., Colman, A. W., & Hollingsworth, R. A. (1998). The current and future role of the internet in patient education. *International journal of medical informatics*, 50(1), 279-285.
- [5] Cassell, M. M., Jackson, C., & Cheuvront, B. (1998). Health Communication on the Internet: An effective channel for health behavior change?. *Journal of health communication*, 3, 71-82.

- [6] Yuri Quintana, Y., Feightner, J. W., Wathen, C.N., Sangster, L.M., and Marshall, J.N. (2001). Providing Quality Preventive Health Information on the Internet: Consumers' Perspectives. *Can Fam Physician*, 47, 1759-1765.
- [7] US Department of Health and Human Services. Healthy People 2010. 2nd ed. Washington. (DC): US Government Printing Office;2000.
- [8] Kreps, G.L. (2006) Disseminating relevant health information to underserved audiences: Implications of the digital divide projects. *J Med Libr Assoc*, 93(supplement):S68-73.
- [9] Sarasohn-Kahn J. The wisdom of patients: health care meets online social media. Accessed October 17, 2012 from <http://www.chcf.org/~media/MEDIA%20LIBRARY%20Files/PDF/H/PDF%20HealthCareSocialMedia.pdf>
- [10] Noah Elkin (2008). How America Searches: Health and Wellness. Accessed October, 17, 2012 from <http://www.icrossing.com/sites/default/files/how-america-searches-health-and-wellness.pdf>
- [11] Forkner-Dunn, J. (2003). Internet-based patient self-care: the next generation of health care delivery. *Journal of Medical Internet Research*, 5(2).
- [12] Ogunrin, F.O., Ogunrin, O., and Akerele, A. (2007). Motivating Nigerian Doctors for Improved Healthcare Delivery. *International Journal of Health Care Quality Assurance*, 20 (4), 290-306.
- [13] World Health Organization (2010). World Health Statistics 2010.
- [14] Acho, O. (2005). *Poor healthcare system: Nigeria's moral difference*. Retrieved April 28, 2008 from http://www.kwenu.com/publications/orabuchi/poor_healthcare.htm
- [15] Chau, P. Y., & Hu, P. J. H. (2002). Investigating healthcare professionals' decisions to accept telemedicine technology: an empirical test of competing theories. *Information & management*, 39(4), 297-311.
- [16] Gagnon, M. P., Godin, G., Gagné, C., Fortin, J. P., Lamothe, L., Reinharz, D., & Cloutier, A. (2003). An adaptation of the theory of interpersonal behaviour to the study of telemedicine adoption by physicians. *International journal of medical informatics*, 71(2), 103-115.
- [17] Horan, T. A., Tulu, B., Hilton, B., & Burton, J. (2004, January). Use of online systems in clinical medical assessments: an analysis of physician acceptance of online disability evaluation systems. In *System Sciences, 2004. Proceedings of the 37th Annual Hawaii International Conference on* (pp. 10-pp). IEEE.
- [18] Wu, J. H., Wang, S. C., & Lin, L. M. (2007). Mobile computing acceptance factors in the healthcare industry: A structural equation model. *International journal of medical informatics*, 76(1), 66-77.
- [19] Lee, M. K., Cheung, C. M., & Chen, Z. (2005). Acceptance of Internet-based learning medium: the role of extrinsic and intrinsic motivation. *Information & Management*, 42(8), 1095-1104.
- [20] Gebauer, H. (2009). Innovation of healthcare services in pharmacies. *International Journal of Behavioural and Healthcare Research*, 1(4), 427-444.
- [21] Nsuangani, N. M., & Pérez, M. A. (2006). Accessing web-based health related information by college students: An exploratory study. *Californian J Health Promot*, 4(1), 64-74.
- [22] Bryan, M. S., Matthew, D., & Fowler PhD, C. (2012). Local Health Department Provision of WIC Services Relative to Local "Need"—Examining 3 States and 5 Years. *Frontiers in Public Health Services and Systems Research*, 1(1), 2.
- [23] Fox, S., Rainie, I., Horrigan, j., Lenhart, A., Spooner, T., Burke, M., et al (2000). The online health care revolution: How the Web helps Americans take better care of themselves. Accessed October 17, 2012 from http://fe01.pewinternet.org/~media/Files/Reports/2000/PIP_Health_Report.pdf.pdf
- [24] Dina L. G. Borzekowski and Vaughn I. Rickert (2001). Adolescent Cybersurfing for Health Information. *Arch Pediatr Adolesc Med*, Vol. 155, pp. 813-817.
- [25] Georgia Tech. Online survey of Internet users. 1999. Available at http://www.cc.gatech.edu/gvu/user_surveys/survey-1998-10/. Accessed October, 2000.
- [26] Gatero, G. (2011). Utilization of ICTs for Accessing Health Information by Medical Professionals in Kenya: A Case Study of Kenyatta National Hospital. *Journal of Health Informatics in Developing Countries*, 5(1).
- [27] Firdhous, M.F.M and Karunaratne, P.M (2011). An ICT Enhanced Life Quality for the Elderly in Developing Countries: Analysis Study Applied to Sri Lanka. *Journal of Health Informatics in Developing Countries*, 5(1)
- [28] Kivuti-Bitok, L. W., McDonnell, G., Pokhariyal, G. P., & Roudsari, A. V. (2012). Self-reported use of internet by cervical cancer clients in two National Referral Hospitals in Kenya. *BMC research notes*, 5(1), 559.

- [29] Yi, M. Y., & Hwang, Y. (2003). Predicting the use of web-based information systems: self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model. *International Journal of Human-Computer Studies*, 59(4), 431-449.
- [30] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.
- [31] Hu, P. J., Chau, P. Y., Sheng, O. R. L., & Tam, K. Y. (1999). Examining the technology acceptance model using physician acceptance of telemedicine technology. *Journal of management information systems*, 91-112.
- [32] Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information systems research*, 11(4), 342-365.
- [33] Saadé, R. G., Nebebe, F., & Tan, W. (2007). Viability of the 'Technology Acceptance Model' in Multimedia Learning Environments: A Comparative Study. *Interdisciplinary Journal of Knowledge and Learning Objects*, 3(2), 175-184.
- [34] Compeau, D. R., and Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS quarterly*, 189-211.
- [35] Igbaria, M., and Iivari, J. (1995). The effects of self-efficacy on computer usage. *Omega*, 23(6), 587-605.
- [36] Gururajan, R., Hafeez-Baig, A., & Kerr, D. (2008). Pakistani healthcare professionals views and opinions about use of wireless handheld devices in healthcare environment. *Electronic Journal of Health Informatics*, 3(2), 1-10.
- [37] Loiacono, E. T., Watson, R. T., & Goodhue, D. L. (2002). WebQual: A measure of website quality. *Marketing theory and applications*, 13(3), 432-438.
- [38] Oh, S., Ahn, J., & Kim, B. (2003). Adoption of broadband Internet in Korea: the role of experience in building attitudes. *Journal of Information Technology*, 18(4), 267-280.
- [39] Luarn, P., & Lin, H. H. (2005). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, 21(6), 873-891.