Factors Associated With Internet Use among Primary Care Patients in Makurdi, Nigeria

[1]EgwudaLivinus, [2]IgbuduTerhemen Joseph, [3]Omokhua, Osarieme Enahoro, [4]Uchendu, Tochukwu

[1,2,3,4]*Department of Family Medicine, Benue State University Teaching Hospital, P.M.B 102131, Makurdi, Nigeria.*

Abstract:

Background: The advent of Internet has brought to the fore new approach to healthcare delivery. Even though studies on the prevalence of internet use by primary care patients are available, only few reports have attempted to identify the factors that are associated with its use by primary care patients.

Aim: The aim of this study was to identify the factors that are associated with internet use among primary care patients in Makurdi, Nigeria.

Materials and Methods: This was a cross-sectional descriptive study that was carried out at Makurdi. A total of 282 primary care patients were recruitedfor the study.

Results: The patients were aged 18-80years with the mean age of 40.3 years. The majority of the participants The majority of the participants were females 163(57.8%), while the males were 119(42.2%). variables that were significantly associated with internet use wereyounger age($X^2 = 73.360,df=5,p<0.0001$).The male sex($X^2=8.170,df=1,p=0.004$).Urban residence ($X^2=50.941,df=1,p<0.0001$). Being a civil servant($X^2=75.147,df=4,p<0.0001$), having tertiary education ($X^2=119.511,df=4,P<0.0001$), good health perception ($X^2=12.875,df=1,p<0.0001$), absence of chronic disease(s)($X^2=22.707,df=2,p<0.0001$), higher monthly income($X^2=10.753,df=1,p=0.001$), single marital status($X^2=50.201,df=4,p<0.001$). There was no associated between internet use and the ethnic group of the patients($X^2=3.151,df=3,p=0.369$).

Conclusion: The factors identified in this study to be significantly associated with internet use by primary care patients were: younger age , male sex, urban residence, tertiary education, good perception of health, absence of chronic disease(s), higher monthly income and being single. These factors should be considered by institutions that are planning to offer consumer health information technology.

Key words: Factors associate, Family Physicians, Internet use, Teaching Hospital.

I. Introduction

Information is the key to any sustainable development.The advent of Internet has brought about a change in the modes of operation 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 the latest report of Internet World Stats, Nigeria has joined the top 20 Internet users in the world and is the first in Africa.[1,2] To buttress this giant stride, the Nigerian Communications Commission(NCC) reported that the number of internet users on the Global System for Mobile communications (GSM) networks has increased from 76,322, 802 in 2014 to 81,892,840 in January 2015.[3] While this report was been commended and celebrated by critical stake-holders in telecommunication, the Nigerian Communication Commission issued fresh report in February 2015. The report indicated that the number of internet users had increased to 83,362,814.[4]

It has been observed that the Internet has become an imperative tool for disseminating health information.[5]The level of any preventive and promotive measure to be imbibed by any individual or patient largely depends on the level of information at the patient's disposal. Studies have shown that the use of internet by patients is a common practice in the developed world. For instance, in a study on Internet use by Primary Care Patients in Columbia, Robin et al., found that 78% of the studied populations were internet users[6]. This figure is comparable with a 2010 Pew survey in which 77% of American adults reported internet use.[7] Similarly Fashner and Drye[8] found higher internet access(80.6%) in a Family Medicine clinic that serves mostly patient with low income. Furthermore, a related cross-sectional study from the waiting room of 13 primary care officers affiliated with the MetroNet Practice based research network in Detroit area reported the percentage of 65% .[20]However, the above report could be said to be in conflict with the few studies from Nigeria. For example, In the Southern part of Nigeria Etukumanaet. al., reported the percentage of internet use by primary care patients to be as low as 40.3%.[10] In the study, less than a third of the participants used the internet to access health information.[10] A related cross-sectional study conducted in the middle-belt region of Nigeria showed a similar

trend.[11] In the study, 54.6% of the primary care patients reported using the internet resource, and about a third of the studied population indicated that they used the internet to obtain health information.[11]

In an attempt to fashion out measures to address this low percentage of internet use among primary care patients in some parts of the world, experts in primary care research are currently exploring the possibility of identifying factors that are associated with internet use among primary care patients. For instance, Robin et. al., approached 713 patients in a cross-sectional survey, the authors observed that lack of computer access and not knowing how to use email or the internet were the most common barriers to internet use. The study also revealed that younger age, higher education and income, better health, and absence of a chronic illness were associated with internet use. Other related studies have identified similar factors to be associated with internet use by patients.[9,12]

Considering the abysmally low rate of internet use by primary care patients in Nigeria; and the fact that a gap has been identified in knowledge on factors associated with internet use among primary care patients, the present study will attempt to address this gap and lay the foundation for future research in this direction. The current study therefore set out to identify the factors that are associated with internet use among primary care patients in Makurdi, Nigeria.

II. Materials And Methods

The study area is Makurdi. Makurdi, the state capital of Benue State is located in middle-belt region of Nigeria. It lies between latitude 7.73^0 and $8.32^0.$ It has a population of about 300,377 people (NPC 2006).[13]The study was conducted in Benue State University Teaching Hospital, which is a 300-bed hospital located in Makurdi. It was commissioned in March 2012 and commenced clinical activities in May 2012. The hospital has 15 clinical departments with over seven hundred healthcare workers. It currently serves a population of over four million people in the middle-belt region of Nigeria.

The present study was a cross-sectional study designed to identifyfactors associated with internet use among primary care patients in Makurdi, Nigeria. The study was carried out between November 2014 and April 2014. The primary care patients were recruited on work days using a well-structured interviewer-administered questionnaire after a signed consent had been obtained from them. The instrument (questionnaire) was validated through a pretest conducted on 10 subjects. To avoid the error of multiple recruitments of subjects, the folders of the recruited subjects were tagged with the word "internet".

A minimum sample size of 263 subjects was calculated using the best estimate of population prevalence obtained from literature review, which is 78%[6]; however, A total of 296 questionnaires were administered through simple random sampling technique. Out of this number, 282 were completely filled, 14 were incompletely filled. The incompletely filled questionnaires were excluded from the study. The questionnaire evaluated theirsocio-demographic characteristics (such as age, maritalstatus, residence, educational level, occupation, income per month) and other variables like health status assessment, presence of chronic illness, what the internet resource was used for, as well as the type of internet search engine(s) explored. In this study, primary care patient was defined as the patient that is seen at General Out Patient Clinic (GOPC) of Benue State University Teaching Hospital, Makurdi, Nigeria. The patients are often seen by the primary care physicians (the Family Physicians). The inclusion criteria for the participants include being a primary care patient at Benue State University Teaching hospital and consenting to participate in the study. Approval for the study was obtained from the Research and Ethical Committee of Benue State University Teaching Hospital, Makurdi. Collated data were analyzed using Statistical Package for Social Sciences for Windows version 18.0 (SPSS, Inc., Chicago, Illinois).

Sample size estimation
The sample size was determined using the formula below[14].

$$n = \frac{\left(z_1 - a\right)^2 \; P\left(1 - P\right)}{d^2}$$

where:

n	=	Minimum sample size
z_{1-a}	=	Constant at 95% confidence interval from two tables which is 1.96 for two-tailed study.
P	=	Best estimate of population prevalence obtained from literature review, which is 78%[9].
d	=	Precision which at 95% confidence interval is 5%.

$$n = \frac{(1.96)^2 \; X \; 0.78(1 - 0.78)}{(0.05)^2} = 263$$

However, 282 primary care patients were recruited for the study

III. Results

A total of 282 primary care patients were recruited for the study. These were aged 18-80years with the mean age of 40.3 years and a standard deviation of 14.3. The majority of the participants were below the of 30 years. Few of the participants were aged 70 years and above. TABLE 1: Shows the age distribution of the subjects.

The socio-demographic profile of participants showed that the majority of the participants were females 163(57.8%), while the males were 119(42.2%). The married participants were the majority 196(69.5%), while separated accounted for only1(1.4%). Almost all the participants 277(98.2%) were Christians, while Muslims were 5(1.8). The Tiv accounted for the majority of the ethnic group 209(74.1%) while the Igede were only 11(3.9%).The occupation of the majority of the participants was civil service 119(42.2%), while those that were applicants were 13(4.6%). On the educational attainment of participants, those with primary education were the least 23(8.2%), while those with tertiary education were the majority 172(61.0%), secondary education accounted for 61(21.8%), and those that had no formal education were 26(9.2%). Table 2: Shows the socio-demographic characteristics of primary care patients.

On the reason for the use of internet resource, majority of the respondents 124(30.7%) indicated that they used the service to send e-mail, while others used it for research 101(25.1%), social network 85(21.1%), entertainment 25(6.2%), and business transactions 15(3.7%). Table 5 and Figure 1: shows the distribution of reasons for using internet by primary care patients.

The respondents that had used internet services utilized different search engines; google was used by more than half 144(55%) of the respondents, while others used yahoo 92(35.1%), hinari 10(3.8%), pubmed 09(3.4%), and only 7(2.7%) used AJOL. Table 6 and Figure 2: shows the distribution of internet search engines used by the primary care patients.

The variables that were significantly associated with internet use include age, sex, residence, religion,,occupation, and education. Others were perception of health, monthly income and chronic illness. Primary care patients that wee aged less than 30 years were more likely to use internet when compared to other age groups($X^2 = 73.360$,df=5,p<0.0001).The male participants were more likely to use the internet than the females(X^2=8.170,df=1,p=0.004) . The participants the resided in urban centers were more likely to use the internet when compared to those in rural centers(X^2=50.941,df=1,p<0.0001). Primary care patients that were of Christian faith were much more likely to use the internet than those that were of Islam faith(X^2=50.94,df=1p<0.0001). Similarly, the participants that were civil servant more likely to use the internet when compared to others that were not (X^2=75.147,df=4,p<0.0001). The participants that had tertiary education qualifications were much more likely to use internet when compared to others that had other forms of qualifications(X^2=119.511,df=4,P<0.0001).Similarly, participants that perceived their health to be good were more likely to use internet when compared to those that perceived their health to be poor(X^2=12.875,df=1,p<0.0001). Furthermore, the participants that indicated not to have chronic illness were more likely to use the internet more than those that indicated to have chronic illness(X^2=22.707,df=2,p<0.0001). The participants that their monthly income was above 5,000 naira were more likely to use internet than those that their monthly income was less than 5,000 naira(X^2=10.753,df=1,p=0.001). The participants that were single were more likely to use internet when compared to others that were no single(X^2=50.201,df=4,p<0.001). However, the study did not find any strong associated between internet use and the ethnic group of the participants(X^2=3.151,df=3,p=0.369).

Table 1: Distribution of age(years) group of primary care patients

Variables	Frequency	Percentage
<30	78	27.7
30-39	61	21.6
40-49	67	23.8
50-59	43	15.2
60-69	22	7.8
70 and above	11	3.9
Total	282	100

Table 2: Socio-demographic distribution of primary care patients

Variables	Frequency	Percentage
Sex:		
Males	119	42.2
Females	163	57.8
Total	282	100
Marital status:		
Married	196	69.5
Single	65	23.0
Separated	1	0.4
Divorced	4	1.4
Widowed	16	5.7
Total	282	100
Religion:		
Christianity	277	98.2
Islam	5	1.8
Others	0	0
Total	282	100
Residence:		
Urban	231	81.2
Rural	51	1.8
Total	282	100
Ethnic groups:		
Tiv	209	74.1
Idoma	24	8.5
Igede	11	3.9
Others	38	13.5
Total	282	100
Occupation:		
Civil servants	119	42.2
Self employed	103	36.5
Applicants	13	4.6
Students	47	16.7
Total	282	100
Education:		
Tertiary	172	61.0
Secondary	61	21.8
Primary	23	8.2
No formal education	26	9.2
Total	282	100
Income:		
<5,000 naira	82	29.0
>5,000 naira	200	71.0
Total	282	100
Perception of health:		
Good	216	76.6
Poor	66	23.4
Total	282	100
Chronic illness		
Yes	122	43.3
No	151	53.5
Do not know	9	3.2
Total	282	100

Table 5: Reasons for using internet resource

Variables	Frequency	Percentage
E-mail	124	30.7
Research	101	25.1
Health information	53	13.2
Social network	85	21.1
Entertainment	25	6.2
Business transactions	15	3.7
Total	403	100

Figure 1: Reasons for using internet resource
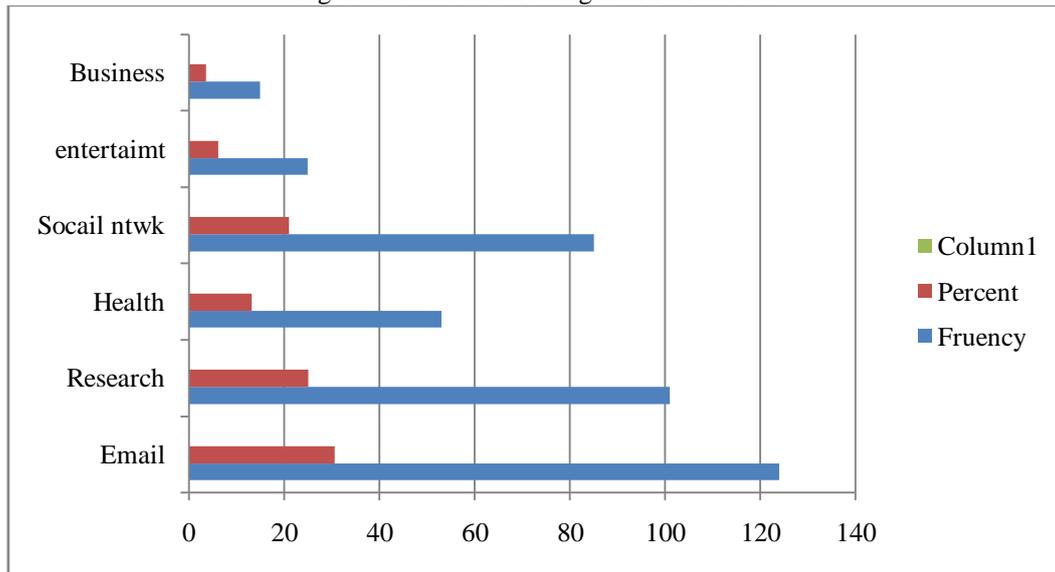
Table 6: Distribution of Internet search engine used by the primary care patients

Variables	Frequency	Percentage
Google	144	55
Yahoo	92	35.1
Hinari	10	3.8
PubMed	9	3.4
AJOL	7	2.7
Total	262	100

Figure 2: Distribution of Internet search engine used by the primary care patients
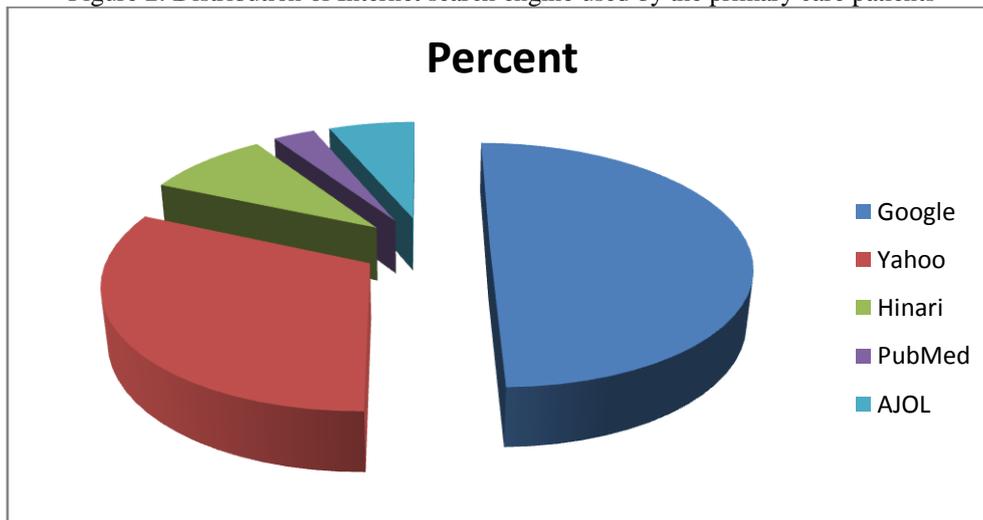
Table 7: Comparison Demographic Characteristics for Internet Users and Non-users

Variables	Internet use		Totaln(%)	X^2	df	P-value
	YES n (%)	NO n(%)				
Age:						
<30	65(83.3)	13(16.7)	78(27.8)			
30-39	43(70.5)	18(29.5)	61(21.7)			
40-49	29(43.3)	38(56.7)	68(23.8)			
50-59	15(35.7)	27(64.3)	42(15.0)			
60-69	2(9.1)	20(90.9) 0(0.0)	22(7.8)			
70 and above	11(100)		11(3.9)	73.360	5	<0.0000
Sex:						
Male	77(64.7)	42(35.3)	119(42.3)			
Female	77(47.5)	85(52.5)	163(57.7)	8.170	1	0.004
Residence						
Urban	149(64.8)	81(35.2)	230(81.9)			

Rural	5(9.8)	46(90.2)	52(57.7)	50.941	1	<0.0000
Religion:						
Christianity	153(55.4)	123(44.6)	277(98.2)			
Islam	1(20.0)	4(80.0)	5(1.8)	50.94	1	<0.0000
Occupation:						
Civil servant	81(68.6)	37(31.4)	116(41.3)			
Self employed	16(29.6)	38(70.4)	54(19.2)			
Applicant	11(84.6)	2(15.4)	13(4.6)			
Student	39(83.0)	8(17.0)	48(16.7)			
Others	7(14.3)	42(85.7)	49(17.4)	75.147	4	<0.0000
Education:						
Tertiary	137(80.1)	34(19.9)	171(60.9)			
Secondary	16(26.2)	45(73.8)	61(21.7)			
Primary	1(4.3)	22(95.7)	24(8.2)			
No formal	0(0.0)	26(100)	26(9.3)	119.511	4	<0.0000
Ethnic group:						
Tiv	111(53.4)	97(46.6)	208(74.0)			
Idoma	11(45.8)	54(54.2)	24(8.5)			
Igede	7(63.6)	4(36.4)	11(3.9)			
Others	25(65.8)	13(34.2)	37(13.6)	3.151	3	0.369
Perception of health:						
Good	131(60.6)	85(39.4)	217(76.9)			
Poor	23(35.4)	42(64.6)	65(23.1)	12.875	1	<0.0000
Have chronic Illness?						
Yes	48(39.3)	4(60.7)	123(43.4)			
No	102(68.0)	48(32.0)	150(53.4)			
Do not know	4(44.4)	5(55.6)	9(3.2)	22.707	2	<0.0000
Monthly ncome:						
<5,000 naira	32(39.5)	49(60.5)	81(28.8)			
>5,000 naira	122(61.0)	78(39.0)	200(71.2)	10.753	1	0.001
Marital status:						
Married	91(46.7)104(53.3)		195(69.1)			
Single	59(90.8)	6(9.2)	65(23.4)			
Separated	0(0.0)	1(100)	1(0.4)			
Divorced	1(25)	3(25)	4(1.4)			
Widowed	3(18.8)	13(81.3)	16(5.7)	50.201	4	<0.0001

IV. Discussion

Even though studies on the prevalence of internet use by primary care patients is attracting the attention of researchers in primary care patients, only few reports have attempted to identify the factors that are associated with internet use by primary care patients. Identifying these factors has become relevant because it is thought to enable public health awareness and intervention programs to be directed appropriately. In the present study, some factors have been linked to internet use in our environment. The study found that patients that were less than 30 years of age used the internet more than any other age bracket. From the age of 50 years and above, there was a remarkable decrease in internet use among the participants studied. This finding is similar to what Robin et. al., noted among primary care patients in Columbia, and it has been described by expertsas a well-known phenomenon.[16]The implication of this is that the older patients, may now be exposed to the risk of losing the potential benefits of increased access to the Internet resouce.[15]In Makurdi, Nigeria, where this study was conducted, local evidence has shown that many people aged 30 years and below are very active in academic activities, social networking as well as research. As a result they explore the internet resource much more.

On the sex of the patients and internet use, the current study revealed a strong association between the two. The male gender used the internet much more than the females. This observation is in conflict with what was reported among primary care patients in the developed country.[6]In the part of the world where this current study was carried out, female education is still a major challenge, while their male counterparts are encouraged to pursue their education to any level they are comfortable with. As a result, they are much more exposed to modernization including the internet revolution. Furthermore, majority of Nigerians reside in rural areas and nothing much has been done by the Nigerian government to improve their quality of life. It is therefore not surprising to observe in the current study that only 9.8% out of the 57.7% residing in the rural areas use the internet. There is need to continue to advocate for improve education and infrastructure in our rural areas so that they can also reap the benefits of internet-based support for managing their health. In addition, the current study has identified a strong link between the occupation of the participants and the internet use. The participants that were civil servants used the internet more than others who were involved in other occupation. Local evidence has proved this finding to be correct. This is because being employed by government provides some level of

financial security and most of these workers reside in the city where facilities for accessing the internet are readily available.

Education prepares an individual for global sustainable development. The current study found a strong association between internet use and education of participants. The participants that had tertiary education qualification accessed the internet more than others who had other levels of education. Robin et. al., agreed with this report.[6]This has brought to the fore the need for government to invest in the education of her populace. Race/ ethnicity played a part in a study conducted in the western country.[6]The study noted that the non-Hispanic white patients used the internet more than the non-Hispanic black. In the current study, there was no strong association between ethnicity and internet use. This might be because the challenge of accepting the new technology cuts across tribes/ethnic groups in Makurdi, Nigeria. In addition, the present study discovered a strong association between health perception and internet use. Those patients that perceived their health to be good made use of internet resource than those that perceived it to be poor. This finding is similar to what was reported by Robins et al., in Columbia.[6] Those that perceived their health to be good are more likely to cope with life and may further encourage themselves to perform more tasks including the use of internet resource.

The challenge of chronic diseases is a major set-back for any patient, and their knowledge of the disease may help to improve their quality of life. This information can easily be accessed via internet resource. However, the current study has revealed that patients that do not have chronic disease accessed the internet more than those that have chronic disease(s) and those that were not aware if they had chronic disease(s). This finding is consistent with the report obtain from primary care study.[6]The patients that do not have chronic disease(s) might cope better with life than those that have it. Previous study has established a strong link between monthly income and internet use by primary care patients. In the current study a similar trend has been observed. The patients that were earning 5,000 naira or more per month used the internet more than the patients that were earning less. The possible explanation for this finding might be that former group had the advantage of having more to spend than the latter. Furthermore, on the marital status and the internet use, the current study revealed that the patients who were single used internet more than the others. Unfortunately, previous study has not looked in this direction. In Makurdi, Nigeria, where the current study was carried out, being single confers "freedom" to the individual and the individual has a lot of time to explore many activities including the internet. Further study is however, advised in this direction.

Limitation: The current study is hospital based; the results obtained may not be an accurate representation of the people of Makurdi, Nigeria.

V. Conclusion

The factors identified in this study to be significantly associated with internet use by primary care patients in Makurdi, Nigeria were younger age, male sex, urban residence, tertiary education, good perception of health, absence of chronic disease(s), higher monthly incomeand being single. These factors should be considered by institutions that are planning to offer consumer health information technology.

Acknowledgement

References

[1]   Internet World Stats (2012). Internet Usage Statistics for Africa, http://www.internetworldstats.com/stats1.htm, Accessed January, 10, 2014.

[2]   Olufemi O, Senanu O, Victoria E.   Awareness and Usage of Internet-based Health Information for Self-Care in Lagos state, Nigeria: Implications for Healthcare Improvement. Journal of Health Informatics in Developing Countries, 2013;7:165-175

[3]   Internet usage on Nigerian's Global System of Mobile Telecommunication Networks. Available at: www.premiumtimesng.com/news/top-news/htm. Accessed on 10/05/2015.

[4]   Eighty three million Internet users in Nigeria. Available at: www.vanguardngr.com/2015/05/83m-internetusers-nigeria-ncc/htlm

[5]   Vance, K., Howe, W., &Dellavalle, R. P. Social internet sites as a source of public health information. Dermatologic clinics,2009; 27: 133-136.

[6]   Robin L. K, Richelle J. Koopman, B. J. Douglas S. W. Lynn E. K. Shannon M. C. Internet use by Primary Care Patients: Where is the digital divide?. Fam Med 2012;44(5):342.

[7]   Pew Internet and American Life Project. Trend data. Washington, DC: Pew Internet and American Life Project, 2011. www.pewinternet.org/ Data-Tools/Download-Data/Trend-Data.aspx. Accessed February, 13,2015

[8]   Fashner J, Drye ST. Internet availability and interest in patients at a family medicine residency clinic. Fam Med 2011;43(2):117-20.

[9]   Kendra LS, Thomas R, Justin N, Raouf S, Anne VN. Family Medicine Patients' Use of Internet for Health Informatio: A MetroNet Study. J Am Board Fam Med 2006(19). 1 39-45

[10]   Etukumana, EA, Egwuda, L, Jiman A,, Andem, N ,Udo, Godwin. Internet use by primary care patients in a tertiary health facility ,Uyo, Nigeria. 4th Wonca African Regional Conference, Ghana 2015. Sustainable Development Goals for the Health of Africa,pg 80

[11]   Livinus E, Terhemen JI, Osariemen OE, Izeji R. Primary Care Patients Internet Use in a Part of Middle-Belt Region of Nigeria.Submitted to International Journal of Medical and Health Health Research for publication.

[12]   Suzanne D, Amber M. R, Thomas H. F, Rakesh B, Ellen R, Vinod K. G, and Charles O. H, Patient Internet Use for Health Information at Three Urban Primary Care Clinics. JAM Med Information Association 2004;11:499-504.

[13]   National Population Commission, Abuja. 2006 National Census Report. World Health Organization Sample Size Determination. A user's Manual. WHO/HST/ESM/86.1

[14]   Gracia E, Herrero J. Internet use and self-rated health among older people: a national survey. J Med Internet Res 2009;11:e49.

[15]   Smith A. Home broadband. Washington, DC: Pew Internet and American Life Project, 2010. http://pewinternet.org/Reports/2010/Home- Broadband-2010.aspx. Accessed October 22, 20114