

INTERNET: A VERITABLE TOOL IN MEDICINE ESPECIALLY IN VILLAGES

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Abstract

Most of the times, the villagers suffer a lot when they are facing health problems. The use of computer technology has been of great help especially when doctors are not available to attend to patients in remote areas especially in developing nations. When patients in the villages know the importance and usage of internet, their problem is solved. Internet is important in medicine especially in the fields of neuropsychology, neurology, psychiatry, behavioral medicine, family medicine, pediatrics', physical medicine and rehabilitation, occupational therapy, nursing, speech and hearing, epidemiology etc. Through internet, cybersurgery could be done. Information could be communicated, drugs could be prescribed and post-operative patients could be monitored.

Keyword: cybersurgery, pediatrics, psychiatry, neurology, neuropsychology,

Introduction

There was a time when technology played a minimal role in health care and medicine. Those were the days when a person's health was in the hands of the physician only and the medicines prescribed by the physician. These days, technology has improved and computers control almost every aspect of health care especially in developed countries. Internet is defined as a global interconnection of many computer networks linked together. The Internet is a network of networks, linking computers to computers sharing the TCP/IP protocols. Each runs software to provide or “serve” information and/or to access and view information. It has been called the I.C.E. (Information, Communication & E-commerce) age. The power of information of medical databases, websites/newsletters and services can be tapped through the net. Communication needs are fulfilled by Email and discussion groups. The e-Commerce could be amongst business (B2B) or targeted at the consumers (B2C). The Internet is the transport vehicle for the information stored in files or documents on another computer. It can be compared to an international communications utility servicing computers. The information needs of the medical professionals include medical research, which can be aided by the use of Internet. One of the most common uses of computers in medicine is for communication by Email and searching for medical information. The other possibilities include e-Commerce that includes - sale & purchase of drugs, equipment, instruments, etc. Medical software can also be located and sold over the net. Internet is an extensive network

of computers around the world or a huge library of information on computers. This is a part of everyone's daily life and has changed the way people live. It has also changed the way in which medicine is practiced. The availability of good and effective software has also helped in opening up a lot of possibilities for their application in the medical field.

Today, it is a global collaborative medium and a rich resource of information of all kinds – health, science, technology, research, education, and commerce. Through a host of emerging tools and protocols, it enables person to-person, computer-to-computer, or person-to-computer communication Sox (1988:10).

Objectives

The objectives of the study are as follows:

- to state the importance of internet in medicine
- to explain the interactions in the cyberspace which help the doctors in Nigeria, especially those practicing in smaller cities, towns, and rural areas

to keep in touch with new technological developments.

- The introduction of the "information superhighway," a concept based on the evolving Internet, has made it reasonable to expect that physicians will soon use portable devices and wireless communications to access clinically pertinent information and to garner advice from remarkably diverse and distant resources. It is already possible to find a large amount of medical information by searching the Internet for topics of

interest. A wide variety of resources are available, such as online versions of the clinical practice guidelines that have been developed and distributed by the Agency for Health Care Policy and Research. The use of such network-based information resources will be enhanced if the network serves a wide variety of clinical needs. For this reason, medical computing experts are seeking to ensure that the evolving national network is built with the needs of the health care system in mind. A range of facilities can be provided to practitioners and to patients who seek access to the health care system or to information on disease prevention and health promotion. Serious questions exist regarding management of such a complex range of information resources, including quality control and effective means for finding the best information available for a specific clinical problem.

Literature Review

A survey on Internet use amongst health care professionals found that, (69%) of the patients discuss the information found on the net with their health care provider. (80%) doctors found this to be helpful as it improved communication, with more knowledge, made the patient a better partner in health care, and saved time in explanations. However, (20%) doctors felt that it was not helpful, as there was a risk of patient self-treatment. Doctors recommended health websites (78%) and support groups (72%) to their patients for their education thereby saving time during their practice. The main obstacles to Internet usage included lack of

time (56%), poor quality of information on the net (29%) and insufficient IT training (25%) Greenes (1990:263).

The study found that the shortcomings of e-Health include - time wasting information searches (59%) and excessive commercial emphasis (35%). The single most important force over the coming decade will be the convergence of healthcare and Internet. There are over one million health websites and nearly 1,000 new sites are being added every month. The importance of health on the Internet can be gauged by the fact that health is the most searched for.

Many developments in science have their origins in science fiction, and telepathology is no exception. It was not until 1980, however, that the first working telepathology system was demonstrated Johnson et al (1985:12).

Some Medical Equipment

There are several basic types:

- Diagnostic equipment includes medical imaging machines, used to aid in diagnosis. Examples are ultrasound and MRI (Magnetic Resonance Imaging) machines, PET (Positron Emission Tomography) and CT (Computed Tomography) scanners, and x-ray machines
- Therapeutic equipment includes infusion pumps, medical lasers and LASIK surgical machines.
- Life Support equipment is used to maintain a patient's bodily function. This includes medical ventilators. Anaesthetic machines, heart-lung machines, ECMO, and dialysis machines.
- Medical monitors allow medical staff to measure a patient's

medical state. Monitors may measure patient vital signs and other parameters including ECG, EEG (Electroencephalography), blood Pressure, and dissolved gases in the blood.

- Medical laboratory equipment automates or helps analyze blood urine and genes.

- Diagnostic Medical Equipment may also be used in the home for certain purposes, e.g. for the control of diabetes mellitus.

Some of these equipment were invented by some people such as: (X-ray, 1895) by Wilhelm Rontgen, electrocardiograph was invented in 1903 by Willem Einthoven, endoscope was invented by Basil Hirschowitz in 1958, ultrasound scan was invented by Ian Donald, 1973, CT (CAT) scan was invented by Godfrey Hounsfield and Allan Cormack in 1982, artificial heart, by Robert Jarvik

Internet Facilities or Services

Computers on the Internet may use one or all of the following Internet services:

- **Electronic mail (e-mail):** Permits you to send and receive mail. Provides access to discussion groups often called Listservs® after the software they operate under.

- **Telnet or remote login:** Permits your computer to log on to another computer and use it as if you were there

- **FTP or File Transfer Protocol:** Allows your computer to rapidly retrieve complex files intact from a remote computer and view or save them on your computer.

- **Gopher:** An early, text-only method for accessing internet documents. Gopher has been almost entirely subsumed in the World Wide Web, but you may still find gopher documents linked to in web pages.

- **The World Wide Web (WWW or “the Web”):** The largest, fastest growing activity on the Internet.

Requirements for Internet Access

In the case of using the internet, the user must have access to a

- Personal Computer equipped with a modem if the internet connection is dial-up connection.

- (MODEM: modulator/demodulator) – This part is used to convert digital signals to analog signals and vice versa

- Username and Password – obtainable only after signing up is completed with the Internet Service Provider (example Tstt or Interserv or Carib Link)

- Telephone line connections which is attached directly to the modem of the computer

- Browser software such as **Netscape Navigator** or **Internet Explorer** – normally obtained from the supplier of the software for computers; then connect to the internet

Types of Connections

- Common methods of consumer Internet access include:

- Dial-up (including ISDN)

- Asymmetric digital subscriber line (ADSL)

- Internet over cable television lines

- LAN (PPPoE) –usually in areas of high population density

- Wi-Fi hotspots

- Wireless Internet Service Provider – sometimes simply called ‘microwave’

- Mobile broadband over terrestrial mobile phone networks using CSD, GPRS, EDGE, EVDO, HSPA etc either through mobile phones or PCs

Satellite Internet

At the turn of the century most residential access was by **dial-up** while access from businesses was usually by higher speed connections. In subsequent years, dial-up declined. Access technologies generally use a modem, which converts digital data to analog for transmission over a particular analog network (the telephone or cable networks).

What is a Browser?

A **browser** is a computer program that resides on your computer enabling you to use the computer to view WWW documents and access the Internet taking advantage of text formatting, hypertext links, images, sounds, motion, and other features.

There are various **web browsers** that can be used. They are:

Chrome, Firefox, Safari, Opera, Internet Explorer, kylo browser (optimized for use on tv screens), flock browser (a social media integrated browser), lunascape (offers a unique triple engine so will take plugins from most browsers)

Applications of Internet in Medical Care

The expanding influence of computers on society is being felt in medicine. Essentially all hospitals and clinics depend on internet for administrative and financial functions and for providing access to clinical data. Most physicians have been exposed to the powerful available systems for searching the biomedical literature by computer. Modern imaging techniques on how to operate the medical equipment can be seen on the internet. The internet has become information system for medical education. The clinical community has long anticipated the day when internet would be able to assist with diagnosis and with making decisions

about patient management. Examples show that technology increasingly will provide physicians with clinically useful decision-support tools. This describes some of the issues in building such systems and in making them easily available and clinically useful Lindberg, et al (1993:269).

MEDLINE is probably the reason for the most common access of the net by medical professionals Carney et al (2004:580). The future trends of cybermedicine include:

- Global exchange of open, non-clinical information by patients and doctor
- Preventive medicine/ Public Health (Telemedicine/ diagnostic/curative)
- Advances in communication technology - Increasing bandwidth, faster speed of access images, voice, data
- Free Internet
- Online hospitals
- Telemedicine/Telesurgery
- Global teaching

Medical transcription has already become a big industry and is helped mainly by the time difference across the continent and the use of Internet for data transfer. The future might see voice recognition based input being used. The use of Internet in medicine is increasing and will have a big impact in the future especially on the way medicine is practiced.

Internet: A Tool in Medicine

The information technology revolution is being described as the most important development in the history of humankind since the industrial revolution.

The fast growing and exciting electronic world of wonders is the INTERNET! With continuing advances in information and communication technology, the

applications of computers in medicine have increased rapidly, and have the potential to revolutionize healthcare. And, the Internet, with its powerful penetration and scalability has become an increasingly popular medical information resource. By re-architecting the workplace around computer-based technology, doctors, researchers, and other healthcare providers are creating a new vision of work and organization in such areas as patient care, medical and health education, and research. This evolving technology includes the electronic medical record, the Internet with its e-mail, WWW (World Wide Web), and file transfer capabilities. There is an urgent need to integrate this technology into a total information system for the clinician in the new century and the new millennium Glowniak et al (1994:271).

Electronic mail has the potential to enhance the professional relationship both between physician and patient, and among physicians of the same and different specialties. There are distinct advantages of communicating via Email:

It is faster than all other forms of mail services. It can be exchanged across time zones.

E-mail is the most useful resource extending the avenues of learning to an international audience through news or list-server groups. Associations, departments, educational sites, organizations, peer-review scientific journals, and Medline database web pages of prime interest to healthcare providers have been developing at an amazing pace. The WWW provides an all in-one medium for image, sound, and video. WWW is the best method of electronic publishing and many magazines and newspapers are available on the Internet. Further

developments of technological advance consist of telemedicine as well as advances in health screening and assessment, international chatting, computer-based training and education in different fields of medicine, and centralization of cyberspace information into database search sites Cullen (2002:270).

Internet, which allows instant transmission of text and graphics and permits talking via computers, is the ideal medium for sharing medical expertise.

It can serve to save precious human life; help treatment in difficult and complicated cases by seeking expert opinion on the Net and overall, facilitates an exchange of ideas. This could well lead to valuable innovations and discoveries. Interactions in the cyberspace will also help the doctors in Nigeria, especially those practising in smaller cities, towns, and rural areas and who therefore, often feel isolated, to keep in touch with new developments. They can become members of information groups and search through free information databases on the Internet.

Healthcare professionals can retrieve plenty of information on such subjects as AIDS, emergency medicine, geriatrics, orthopaedics, rehabilitation, preventive medicine, public health, rural medicine, transplant medicine, and travel medicine Elstein et al (1978:57) all available on the many web sites. Healthcare professionals can also become a part of the various discussion for a of their interest and can exchange their experience. Information on higher education in medical sciences and job opportunities in different hospitals and research institutes can also be found on the Internet.

Healthcare professionals can also get information on health workers, societies and hospitals, healthcare companies, and on healthcare management and policy. On an exploratory browsing of the Net, they can query a database for known references or retrieve an exhaustive list of relevant material to review the available literature or pull up a list of first quality recent references to answer a particular question.

With the advent of the Internet, information resources (on-line databases, CD-ROM producers, full text documents of various societies and the commercial agencies, news groups, directories, individual home pages and corporate resources) are now open through internet. Literature search can be done on databases such as MEDLINE, EMBASE and BIOSIS as well as on other Web sites in no time.

A large amount of information on patient care, education, and support is available. Most health sites have traditionally been information-based and the Net (Internet) is, for example, the best way to find a self-help group for any disease. It's also a huge source of details on individual diseases, no matter how obscure, and is increasingly being used by patients as a way of locating the best hospitals and doctors.

Changes in healthcare delivery and the explosion of health information available on the Internet are already affecting primary healthcare practice in Nigeria. They refer to the growth rate in Internet access and all the improvements in performance resulting from new technologies, in particular in the areas of telemedicine and in communication between patient and healthcare professionals Ajuwon (2006:7).

Increasingly, the Internet will be used to convey more 'real-time'

information. A physician practicing in a remote village can now consult a specialist sitting at any distance by providing him all images and data on-line, thus eliminating the risk involved in and save the time and money spent on travel.

While Internet technology has dramatically improved the access to health material, the biggest shake-up is taking place in the General Physician's clinic. Doctors can key their patients' symptoms into a computer and receive an instant diagnosis.

In several rural areas of the developed countries, doctors are using ISSN-based technology to enable a medical consultant to examine patients 120 miles away.

In years to come, many patients will no longer need to travel to see a specialist. Diagnosis will be made in their family doctor's clinic, by a consultant examining them with the help of video images and remote sensors that can relay data on blood pressure, heart rate, and other vital signs.

The Net is also set to allow doctors to change the way they treat patients. It is anticipated that doctors will be able to use a DNA database of patients to tailor drugs for their specific conditions and eliminate possible side effects Younger (2010:2-10).

The Internet has become a new platform for telemedicine. Cyber Medical Center (CMC), a project that integrates the technologies of multimedia, database management, a multiple site video-conferencing system and the World Wide Web (www) is aiming to create a multimedia network system for the electronic management of patients' records, teleconsultation, on-line prescription, on-line continuing medical education and information services on the web Kim et al

(2009:136). Some doctors who are in developed countries are already using the Internet to make diagnoses, carry out remote examinations, and give consultations. Soon they will operate remotely on patients thousands of miles away and use virtual reality to allow leading surgeons without leaving their offices to consult around the bed of a patient.

It is possible to speak (transmit voice) in real time on the Internet. Audio-conferencing programmes work by digitalising speech and then sending the digital data over the Internet.

Net is also impacting the way surgery is carried out. Cybersurgery is the latest health craze on the Net. Virtual Real Markup Language (VRML) enables doctors to actually view complicated surgeries underway in real time environment Sahapong (2009:435) which helps the younger surgeons to learn from the vast experience of their senior colleagues and peers. There is no more a need to visit a doctor for estimates on the expenses for a given treatment or corrective surgery. For plastic surgery, just scan in your picture and e-mail it along with a credit card consultation fee of a particular amount to [HYPERLINK at http://www.celebrity](http://www.celebrity) or www.doctor.com/personal.html which is run by a team of doctors, and back comes the advice on what work is needed, and how much is it likely to cost.

Remote sensor technology is already changing the way we care for the elderly. In Germany, doctors and social workers have set up a telemonitoring system where elderly people and the chronically ill and housebound are monitored, using a camera and a high speed telephone line.

Telepathology can now be used for remote primary diagnosis,

remote referral to a specialist in pathology, remote teaching, remote presentation of post-mortem or microscopic findings, quality assurance image circulation and feedback, and consensus diagnosis for pathological review in clinical trials. In the next five to ten years it will be possible to build sensors that are almost as powerful as the entire pathology laboratory. The doctor can then search a database on the Net and look up data on other people who suffered from similar symptoms and immediately conclude.

The resources available on the World Wide Web (www) can be deployed as a very useful “Information for Health” tool bridging the information gap and reducing the number of accidents and risks due to misuse or improper use of drugs. Misuse of prescription medications is a serious problem largely due to lack of information. WWW can well be deployed to fill in this gap in appropriate and safe use of prescription drugs. Within the past 10 years, a wealth of data has shown that diet and exercise play an enormous role in fighting disease Bennett et al (2004:120).

The digital divide in information between The World Health Organization (WHO) and the Open Society Institute (OSI) Smith (2007), a part of the Soros Foundation network, have teamed up with leading information providers, ISI and Silver Platter, and other public and private partners to provide access to high quality scientific information via the Internet, for research centers in the countries of Africa, Central Asia, and Eastern Europe.

Conclusion

Computer is useful in medicine. It is used in diagnosing some diseases, researching as well as in the general administration in the

hospital environment through Internet. With the emergence of medical informatics as an academic discipline and the training of individuals who can work effectively at the interface between medicine and computer science, it is likely that physicians and other health professionals will see rapid development of clinically useful tools that are sensitive to the realities of the health care environment. Among such systems will be decision-support programs that are integrated with patient data-management systems. They will serve as knowledge-access and management tools for physicians who will rely on their support much as they rely on paper-based reference tools today.

Recommendations

- It is recommended that hospitals should be globally connected (Internet) for medical officers or experts to browse on daily basis so as to know the latest development on a particular clinical practice.
- Since the significance of internet in medicine is great, it is hereby recommended that medical experts/officers who don't know how to use computers should go for computer training as the importance of internet is paramount.
- Young surgeons should make use of Cybersurgery if they are confused from modern textbooks.
- Health workers in remote areas should make use of internet for health information on diagnosis, clinical, drugs etc.

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