

AN APPRAISAL OF NURSING INFORMATICS

E. A. Nwoke and S.N.O. Ibe

Abstract

Nursing informatics is the use of technology and/or computer system to collect, store, process, display, retrieve, and communicate timely data and information in and across health care facilities. Nursing is greatly impacted by the explosive growth of computers. There are tele-services, tele-health, tele-medicine, tele-nursing, telephone nursing and telehomecare. Through nursing informatics, clinical information can be shared with other professional colleagues including national and international experts. Tele nursing is cost effective by reducing the length of hospital stay and use of expensive health care services.

Introduction

Informatics is a relatively new area of study within the computer and communication field. It encompasses all the principles of computing, telecomputing and human factors domains as it applies to the management, distribution, and flow of information (Nagy, 1991). The advent of informatics has been compared to the coming of electricity. We are still discovering new uses for it and it is indispensable (World Health Organization, 1993). Opper and Fersko-Weiss (1992) stated that the authorities throughout the world realized that as industrialized nations migrate towards more information- based societies, they will find themselves moving at relentless pace. It is the revolutions that are taking place in the communications and information technology industries that offer the most hope by providing universal access to information for those who choose to pursue it.

Health informatics (medical informatics) is a rapidly developing scientific field that deals with the storing, retrieving and optimal use of biomedical information, data and knowledge for problem solving and decision making. It touches on all basic and applied fields in biomedical science and it is closely tied to modern information technologies, notably in the areas of computing and communication (Shortliffe and Perrault, 1990).

Health care informatics however, is truly interdisciplinary. In its truest form it focuses on the care of the patient and not on a specific discipline (Hannah, Ball and Edwards, 1990). Although there are specific bodies of knowledge for each health care profession - nursing, dentistry, dietetics, pharmacy, medicine etcetera, interface at the patient.

Nursing informatics according to Scholes and Barber (1980) is the application of computer technology to all fields of nursing:- Nursing services, nursing education, and nursing research. Saba and McCormick (1997) referred to nursing informatics as the use of technology and/or computer system to collect, store, process, display, retrieve, and communicate timely data and information in and across health care facilities and Goossen (1996) also defined nursing informatics as the multidisciplinary scientific endeavour of analyzing, formalizing, and modeling how nurses collect and manage data, process data into information and knowledge, make knowledge based decisions and references for patient care and use this empirical and experiential knowledge in order to broaden the scope and enhance the quality of their professional practice.

Like any knowledge-intensive field these days, nursing benefits greatly from the explosive growth of computers. Nursing Informatics is a broad ranging field that combines nursing skills with computer expertise. Jobs in this area might include a nurse programmer who writes or modifies programmes for use by nurses; nurse communicators who work with other nurses to identify computer system needs; or to assist in the training and implementation of those systems; informatics nurse managers who manage or administer information systems; or nurse vendor representative who work for specific vendors to demonstrate systems to potential customers.

Education preparation for nursing informatics can take variety of paths. Some areas are more suited to self study such as clinical nurse who thinks about computer implementation issues in their nursing unit. As in most fields, nursing programmes are increasing the use of computers in their basic curriculum. Bachelors and graduate level training is also available either within a nursing programme or outside of it. It depends on how much knowledge of computer you want to acquire.

Importance of Informatics to Nursing

- Informatics can make nursing practice visible in local, national and international health care data sets thus, empowering nurses with information to influence policy.
- Information is a critical component of effective decision-making and high quality nursing practice. The information and knowledge gained through nursing informatics can bring increased awareness and understanding of nursing and health care issues.
- Nursing informatics is committed to maintaining a clinical perspective and promoting research that would bear directly on improving patient care (American Nurses Association [ANA], 1996).

Visibility of Nursing

- A unified nursing language system will make nursing data visible in health care systems. Without a unified nursing language system, data cannot be compared and interchanged across sources. Researchers have identified terminology standards as an essential building block for the development of information systems that support clinical decision making and evidenced-based practice. A major ICN programme for the development of a unified nursing language system is the International Classification for Nursing Practice (ICNP) The ICNP supports both the existing work in nursing terminology development and advances nursing terminology development that is compliant with international standards in a manner consistent with other health disciplines (American Nurses Association [ANA], 1996).

Integration of Nursing Data in Clinical Information Systems

- Integration of health care data is essential in an environment of multidisciplinary health care across multiple delivery systems. With increased globalization, we must promote information systems that will facilitate communication and data sharing across multiple practitioners, delivery settings, geographic settings and languages. The systems also must support effective communications with clients and families. The integration of health care information systems is essential for the realization of an electronic Health Record. Integrated systems also will enhance clinical, administrative and health policy decision-making capabilities (American Nurses Association [ANA], 1996).

Supporting Evidence-Based Practice

- Research in nursing informatics will examine and enhance the use of clinical information systems to support evidence-based practice. Clinical information systems can facilitate access to guidelines and references of best practices within nurses' workflow. Similarly, using ICNP in information systems will stimulate the creation of clinical data warehouses and encourage the examination of clinical nursing data together with administrative data to evaluate practice and generate new knowledge (American Nurses Association [ANA], 1996).

Peterson and Schneider (1986) linked health care and communication by saying that health care delivery, interaction and communication are inseparably related to each other. It was further stated by Peterson and Schneider that without interaction, there will be no health care and interaction implies communication.

World Health Organization (WHO) uses informatics and telematics extensively and has emphasized the importance of the technology and also underlined health as one of its principal beneficiaries (WHO, 1993). The organization is involved in a number of important collaborative activities with member states that are either directly concerned with informatics or include elements of informatics in their health development systems.

The WHO headquarters in Geneva is a beehive of informatics support activities. WHO (1993) also reported that health care delivery looks up to informatics to provide increased efficiency with patients' records, improved quality assurance, improved surveillance, improved decision making processes, etcetera. The capacity to manage all these information must match its rate of generation to avoid the monstrous situation of information explosion which arises when the system is overwhelmed by the sheer variety and volume of the information generated and the inability to process information to any useful end. One needs not to emphasize that unprocessed information can easily pile up and become cumbersome, litter in different offices where they remain perpetually irrelevant to ongoing and future programmes. The computer is one facility with the capacity to lift the information burden off the shoulders of service personnel and

must therefore be very welcome.

Tele Nursing

Tele nursing refers to the use of telecommunications technology in nursing to enhance patients' care. It involves the use of electromagnetic channels (e.g. wire, radio, and optical) to transmit voice, data and video communications signals. It is also defined as distance communications using electrical or optical transmission between humans and/or computers.

There are tele- services, tele- health, tele-medicine, tele-nursing, telephone nursing and telehomecare.

Tele- Services: Terms with the prefix tele, meaning distance are used to describe the many health care services provided via telecommunications. The common denominators of teleservices are distance and technology. Tele-services use telecommunication technologies to transmit information from one side to another. Applications in clinical practice, research, and administration include telephone consultation, triage and follow up (National Council of State Boards of Nursing [NCSBN], 1997 & Pond, 2000). E-mail inquiries and advice (Yensen, 1996), distance learning (Connors, 1997), videoconferencing (Chaffe, 1999 & NCSBN, 1997), videomonitoring (Borchers and Kee, 1999 & Chaffee, 1999), and digital photography (Cobb, McDonald, & Stenkamph, 2000).

Telehealth: Telehealth, the delivery of health services over distances, has replaced telemedicine as the inclusive term used to describe the wide range of services delivered by all health related disciplines (ANA, 1996; Chaffee, 1999; Connors, 1997; Helmlinger & Milholland, 1997). The term telecare is comparable to telehealth, a generic term referring to the delivery of care over distance.

Telemedicine: is broadly defined as medicine practiced at a distance (Wootton, 2000). Specialty applications of telemedicine include, but not limited to, telepathology, telepsychiatry, teledermatology, and teleoncology.

Telenursing: Telenursing, the delivery of nursing care and services using telecommunications, increases access to nursing care interventions for clients in remote or distance locations (Chaffee, 1999; Helmlinger & Milholland, 1997 & Yesen, 1996). Although typically associated with telephone nursing, telenursing has grown far beyond the use of the telephone, now incorporating a vast array of telecommunications technologies e.g. interactive video, videomonitoring, digital cameras etcetera (Bleich, 1998; Milholland, 1995 & NCSBN, 1997).

Telephone Nursing: is the use of nursing process to provide care to patients over the telephone (American Academy of Ambulatory Care Nurses [AAACN], 1997). First used by nurses in the late 1800s, the telephone is now used to deliver an extraordinary variety of nursing care and services nation wide. Telephone triage is the largest and most recognized component of telephone nursing. Telephone triage, a staple in nursing, is considered the forerunner of telemedicine (Connors, 1997 & Pond, 2000). In addition to telephone triage, telephone nursing services include advice and information, appointments and referrals, symptom management, demand management and disease management.

Telehomecare: Incorporates the principle of telehealth into the home care setting, is not specific to nursing. However, within nursing Milholland (1995) observed that home health nurses use technology to provide services in the home which enhance the efficiency and quality of care. In home care nurses use systems that allow home monitoring of physiologic parameters, such as blood pressure, blood glucose, respiratory peak flow, and weight measurement via the internet. Through interactive video systems, patients contact on-call nurses any time and arrange for a video consultation to address any problems; e.g. how to change a dressing, give an insulin injection, or discuss increasing shortness of breath (Russo, 2001). This is very helpful to those with chronic conditions and debilitating illnesses.

Importance of Telenursing

- It helps patients and families to be active participants in care,
- It enables nurses to provide accurate and timely information and support online.
- Continuity of care is enhanced by encouraging frequent contacts between health care providers and individual patients and their families.
- It is cost effective by reducing the length of hospital stay and use of expensive health care services

- e.g. Physician's office, emergency units, hospitals and nursing homes.
- There is a decrease in total health care costs and increased access to health care with more appropriate use of resources.
- Limited resources can benefit a large population spread over a broad geographical region
- Adults with chronic conditions who need frequent monitoring, assessment, and maintenance but do not meet home care criteria or have no money to pay for services can benefit from technology. (Britton, Keehner, Still & Walder, 1999).

Moore (2001) reported that clinical information can be shared with other professional colleagues including national and international experts. The new technologies also increase access to nursing education, particularly continuing education. E.g. teaching off campus, video-conferencing, online learning and multi media distance education and clinical skills could be learned and practiced through patient simulation modeling.

Conclusion

Although the information society offers tremendous potential for reducing the knowledge gap between professionals and patients, it also brings a risk of widening the gap between those who have access to new technology and those who have been excluded.

References

- American Academy of Ambulatory Care Nurses (1997). In Greenberg, M. E.(2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.aacn.org.
- American Nurses Association (1996). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.nurses.org
- Bleich, (1998). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.uooule.com.
- Borchers & Kee (1999). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.uooule.com.
- Britton, B. P; Keehner, E. M; Still A. T. & Walder, C. M. (1999). Innovative approaches to patient care management using telehomecare. *Home Health Care Consultant*, 6(12), 11-16.
- Chaffee (1999). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.uooule.com
- Cobb, McDonald & Stannkamp (2000). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.uooule.com
- Connors, (1997). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.uooule.com
- Goossen, W. T. F. (1996). In Thede, L.Q. (2008). Some nursing informatics definitions. Retrieved may 16, 2008 from www.nooule.com
- Hannah, K.J; Ball, M.J & Edwards, K. J. (1999). *Introduction to nursing informatics*. 2nd edition, New York:Springer- Verlag.
- Helmlinger & Milholland (1997). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.nooule.com
- Milholland (1995). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.google.com
- Moore, A. (2001). Cross border care nursing. *Standard*, 16, (9) 14
- Nagy, N. (1991). Informatics and the developing world. *Finance and Development*, 28(4), 45-47.
- National Council of States Board of Nursing, (1997). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.google.com.

- Opper, S & Fersko-Weiss, H. (1992). *Technology for teams; Enhanced productivity in networked organizations*. Reinhold, NY: Van Nostrand.
- Peterson, H. E & Schneider, W. (1986). Human-Computer communications in health care: Proceedings of the IFIP-IMIA Second *Stockholm Conference on communications in Health Care*. NY,NY, Elsevier Publishing Company.
- Pond (2000). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.google.com.
- Russo, H. (2001). Window of opportunity for Home Care Nurses: Telehealth technologies. *Online Journal of Issues in Nursing*, 6 (4), 4.
- Saba, V.K. & McCormick, K. A. (1995). In Thede, L.Q. (2008). Some nursing informatics definitions. Retrieved may 16, 2008 from www.google.com
- Scholes, M. & Barber, B. (1980). Towards nursing informatics. In Lindberg, D. A. D & Kaihara (Eds.) MEDINFO, 1980 in Thede, L.Q. (2008) Some nursing informatics definitions. Retrieved may 16, 2008 from www.google.com
-
- Shortliffe, E. H & Perrault, L. (1990). *Medical informatics: Computer applications in health care*. Reading, MA: Addison- Wesley.
- Wooton (2000). In Greenberg, M. E. (2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.google.com
- World Health Organization, (1993). Informatics vital to primary health care development. *World Health Quarterly Bulletin* 8(2), 1-2, 7-8.
- Yesen (1996). In Greenberg, M. E.(2000). The domain of telenursing: Issues and prospects. Retrieved may 16, 2008 from www.google.com.