



Use of Computers in Nursing

CHAPTER OUTLINE

- Introduction
- Use of Computer in Teaching-learning/Nursing Education
- Use of Computer in Nursing Practice
- Use of Computer in Nursing Administration
- Use of Computer in Nursing Research

KEY TERMS

Access: To gain entry to data or reading the data or writing the data.

Access time: The time period between seeking the data and retrieving it.

Application: Data processing by a given set of instructions.

Backup: Saving any data or information for future use.

Computer: An electronic device that processes data to convert it into valuable information through the pre-defined instructions.

Computer-aided learning: Facilitating learning with the use of computer.

Input device: Used to enter data in the computer.

Nursing informatics: As per IMIA special interest group on nursing informatics 2009, nursing informatics is “the science and practice that integrates nursing, its information and communication technologies to promote the health of people, families and communicates worldwide”.

Patient management system: The process of managing all the tasks related to the medical care to be given to the patient with the help of computers forms a complex system called the patient management system.

Telenursing: Telenursing is a subcategory of telemedicine that provides a platform for nursing practitioners to provide nursing care in remote, residential areas or the health care facilities.

Telemedicine: Telemedicine is a broader term used for rendering health related services with the use of information and the communication technology.

INTRODUCTION

“Technology is a useful servant but a dangerous master.”

—Christian Lous Lange

The world in which we are residing is presently working on the dynamic mode. The technology has become a useful servant in every sphere of life. As we witness the sunrise in the morning and the moment we lay down on our bed to sleep at night, we are using technology in one or the other way. Technology makes what was once impossible, possible. It has brought many possibilities in the field of nursing as well which we are going to focus in this chapter.

USE OF COMPUTER IN TEACHING-LEARNING/NURSING EDUCATION

Computers in the field of nursing education is not a novel concept. It has been around 35 years since the use of computers in the discipline of nursing education. In the year 1963, the first use of computer-based education was testified under the name PLATO. But, it was in the 21st century that the computers were made an important part of the nursing education system.

The student nurses as well as the nursing tutors are using computers for multiple purposes and some of them are:

- **Teaching process:** The student nurses are using computers to make lesson plans and performing classroom teachings or presentations while the teachers are using the technology for providing better and improved lessons. They enable the teachers to convey their message effectively.
- **Learning process:** Computers enhance the learning process as they help in stimulating all the senses of the students while learning new things. The use of computers improves the quality of the learning process. As mentioned earlier, computers enable teachers to convey their message better, this in turn enhances the learning process of the students.
- **Simulation:** Simulation of procedures or hospital setting enables the students to understand the concept better and get themselves adapted to the environment before actually facing it. This is possible due to the presence of computer technology. It helps the student nurses to practice their skills and learn them by doing.
- **Communication:** In the midst of the pandemic, when the student-teacher interaction was deteriorating, it was the computer technology that helped it to survive. Apps like “Nursing Next Live” or the live lectures on YouTube channels or the zoom classes, all have proved to reduce the achievement gaps and enhance learning.
- **Up-to-date information:** The dissemination of evidenced-based and up-to-date information from researches done across the seven seas is possible just because of this computer technology. Latest information about the health practices being followed enhance the skills of the nursing students and make them more competent.
- **Maintenance of record:** Computers serve as a reliable source of record keeping as the students’ records can be recorded faster and stored safe for the long-term use in the computers. This also helps in minimizing the use of paper and hence prevents deforestation.
- **Evaluation:** No stone is left unturned by the technology. Nowadays, even in the process of evaluation, the educational institutes are using computer-based testing (CBT). One of the most renowned institutes of Delhi, i.e., AIIMS is also taking CBT for their NORCET exam. It is expected that in the coming future, more and more institutes are going to adapt CBT for all their entrance examinations.

USE OF COMPUTER IN NURSING PRACTICE

The prime responsibility of a nurse is to provide advanced, efficient and competent nursing care to the individual, family and community. The advancement of technology is opening new avenues like mobile nursing services, military nursing services, occupational health services, school health services, etc. that demand extra skills. The use of computer is now widely used in the field of nursing practice in the form of patient management system, telemedicine and telenursing.

Patient Management System

Presently, an automated computerized system is being used to manage all the needs of the hospital right from the admission to the discharge and that system is known as the *patient management system (PMS)* or the *hospital management system*. It has decreased the long queues of the patients in the hospitals and assisted the health care professionals in maintaining records, documenting the findings timely, minimizing errors, preventing duplication of work, decreasing the workload, taking prompt actions and in the process of decision making. Such systems are developed as per the guidelines and standards laid by the World Health Organization (WHO). The PMS provides better security as the data is password protected data and adheres to patient safety as it minimizes errors compared to the conventional system.

Patient management system not only offers a paperless structure for managing the patient data but it also provides opportunity for paperless transactions along with a remarkable system of interoperability that enhances the quality of patient care through integration of patient's data. The cherry on the cake is that the data in PMS is displayed in a graphical form that eases the process of analysis performed by the top level managers. The system also helps in managing the human workflow, maintaining their attendance, viewing their available accommodation details and duty rosters.

Telemedicine

Technology has unfolded various areas of the health sectors and one of them is *Telemedicine* or *Tele-health* or *E-health*. As 70% of the population of India live in rural areas and 90% of healthcare facilities are accessible in urban areas, therefore, to fill this gap, services like Telehealth came into existence. Telehealth is a broader term used for the health services provided by the health care professionals to people who are unable to reach the hospitals for any reason. Telenursing is a branch of Telehealth that is going to be discussed later in this chapter. Telehealth has become a liaison between the people in need of the health care services and the professionals who are rendering the health care services at a nominal cost. Video conferencing became the medium for providing such services through face to face interactive sessions. Telemedicine proved to be a boon for people worldwide especially in the pandemic situation. This is broadly divided into two categories: Emergency and Non-emergency/Regular healthcare services. *National Task Force on Telemedicine (2005)* gave the concept of "level-m" which means "Mobile Telemedicine" that directly connects the people living in rural areas to the nearby PHCs or CHCs or District hospitals. For implementing this concept, mobile vans have been established.

Telenursing

Nursing is an emerging profession and is witnessing a great change in terms of technology. Telenursing is one of its best examples. Telenursing is the use of telecommunication technology to render nursing services to

people inhabiting at distant places. The patients are able to communicate with the nursing professionals while sitting at their place through the devices like phones, routers (for internet access), web cams, etc. At times, the nurses also use personal digital assistants (PDAs) for easy access to the medical information anytime and anywhere. PDAs or hand held computers also provide assistance in documentation when working in remote areas. The technology also provides an opportunity to conduct video conferencing that helps in reducing the gap between the patients and the health care providers. The latest technology being used in this sector is the “Ring sensor” which is a type of device worn by the patient for 24 hours/day that transmits wireless data to the telenursing center. There are endless possibilities in this field because of evolving technologies.

USE OF COMPUTER IN NURSING ADMINISTRATION

Computers are now the part and parcel of the nursing profession. There could hardly be any administrative department in nursing that is not using computers in one or the other form. The informatics is used in the form of human resource management, personnel management, managing the patient information system, inter-departmental coordination as well as in quality assurance.

Computer in Human Resource Management and Personnel Management

Human resource management is an important aspect of the managerial functions of a nurse. When we talk about the human resource management with the help of computer applications, it is known as *Human Resource Information System (HRIS)*. Computer acts as an economical way of managing the human resources. It not only saves time but also minimizes the efforts of the nursing managers. HRIS provides a huge pool of professionals from which the nursing manager can easily select as per the requirement of the institute. Once the selection process is completed, the computers help in managing the data of the health care professionals and also assist in record keeping. Moreover, it assembles the raw data and converts it into meaningful information that supports decision making. The nurse administrator can easily make rotation plans and can also maintain the attendance and the leave records. In addition to this, the system provides passage of information of the employees to top levels swiftly. Payrolls, increments and salaries can also be easily recorded using the available software. Therefore, overall, computers have lessened the burden of nursing managers and helped in enhancing the productivity.

Computer in Patient Information System

Technology has not only proven to be advantageous for the personnel management but it has brought the patient information system to another level. It is also known as *patient management system* that manages the information related to the patients. It helps to keep a track of the patients, enables better management, maintains electronic health records and promotes interoperability while minimizing errors that promotes patient's safety. It provides data regarding the dietary plan, drug administration plan, drug interaction, laboratory test requisition, availability of bed and rooms, transfer of patient, etc.

Interdepartmental Coordination

The emergence of electronic health records has standardized the patient care and helped in enhancing the level of information sharing. This has given birth to interoperability that has made the access to health

services universal. Interoperability has made interdepartmental coordination easier and within no time. This helps in saving a lot of time that provides to be a boon in case of emergency situation. The patients are given a unique ID that can be used universally that enables integration of data and hence better health care facilities worldwide.

Quality Assurance

The use of computers in nursing administration also serves as a basis for quality assurance. The work of the entire staff can be recorded and assessed by using certain application for Workforce analysis. It keeps an eye on the performance and productivity of the employees that can be adjusted as per the needs of the healthcare organization to improve the quality of healthcare. It also helps in planning for career development and organize in-service and continuing education for the nursing personnel. It provides data for nursing audit and suggests the scope of improvement in the required fields that ensures provision of quality-based care. It has eased the process of accreditation.

USE OF COMPUTER IN NURSING RESEARCH

The demand of evidence-based practice is increasing day by day in the field of nursing and that is possible because of research. Research is the systematic process of recollecting facts. The computers have proven to be of great value in each step of this systematic process right from the problem identification, reviewing the literature, selecting the research design, collecting data, performing analysis and dissemination of the findings.

The first step in the research process is to identify the research problem. For doing so, one can take the help of the computer technology. The researchers can use online sources like Shodhganga, PubMed, etc. to view different types of researches done in India. The limitations of those researches can be a good source for identifying the gaps and make your problem statement.

Similarly, for reviewing the literature on the topic under study, online sources like MEDLINE, PubMed, Cochrane Collaboration, CINHALL, etc. can be used. The online databases provide the abstracts as well as the complete research papers that provide an idea about the research design, tools used for data collection (paperless technique or online questionnaires), method of data analysis (using SPSS, MINITAB), etc. Computers also provide a portal for disseminating the findings of the research worldwide so that enormous amount of data is made accessible to numerous users. Some of these databases can provide free access while others are the paid ones. Thus, computers assist in every step of the research process and saves a lot of time and money of the researchers.

ASSESS YOURSELF**Short Answer Questions**

1. Define computer.
2. How can the computer be used in the teaching-learning process?
3. What do you mean by Telemedicine?
4. How Telenursing differs from Telemedicine?
5. Write a brief note on the use of computer in nursing administration.

Long Answer Questions

1. Write in detail about the uses of computer in health care delivery system.
2. Throw light on the concept that nowadays computers are widely used in the field of nursing education. Support your answer with related examples.
3. Explain in detail about the concept of Telemedicine.
4. What are the uses of computer in the field of nursing administration?
5. Give a detailed explanation of how the computers can be used for conducting the research.

ACTIVITY**Activity for Students**

Activity 1: Ask the students to use computer to deliver their class presentation.

Activity 2: Make an assignment with the use of computer to demonstrate the working of patient information System.

Activity 3: Make a group of four and use your computer for:

- i. Identifying the problem statement.
- ii. Collecting the review of literature for the above statement.

Now, note what are the results.

Activity 4: Make a report on your experience with CINAHL.

Activity for Teachers

Activity 1: Help students to understand the basic use of computers in the field of nursing.

Activity 2: Explain the students how to manage patient's data in the hospital information system.

Activity 3: Show different online databases related to nursing.

Activity 4: Make students operate/use Shodhganga.