FUTURISTIC TRENDS IN PHARMACY AND NURSING

MRS. D. BIJILIN REENI

MEDICAL SURGICAL NURSING DEPARTMENT

BHAARATH COLLEGE OF NURSING

SELAIYUR, CHENNAI-73

Email: bijilinreenid@gmail.com

**ABSTRACT**

Nurses should be concerned about future directions for nursing. As the twenty-first century approaches, opportunities abound to facilitate movement toward the goal of full professional status. Whether nursing will have a bright, new professional image dependson how conscientious and industrious nurses are in their efforts to achieve professionalism. If nursing is to fulfill its social mandate for providing optimum healthcare for society, then nurse should be responsible and committed to this endeavour. Inorder for nursing to become a recognized, scientific profession dynamic action isrequired, especially on the part of those referred to as professionals.

**Keywords-Pharmacy, Nursing, trends, futuristic**

1. **INTRODUCTION**

 Far and wide in the nation, people are living longer and healthier. This longevity is described as healthier lifestyles, a skilled health workforce, development in science and understanding of human health and diseases, and continuing discovery of new therapies for managing acute and chronic conditions. As the population ages, however, its interaction with the health care system demands. Larger patient populations in general, and increasing numbers with chronic diseases in particular, furnishes to rapidly rising demands for health providers and facilities that must stretch to meet growing needs. Within the pharmacy workforce, evidence of demand was seen in the dramatic increase in prescriptions written and dispensed in India. During the COVID 19 alone, the number of retail prescriptions dispensed increased by 45%, from 1.8 billion in 1992 to almost 2.9 billion in 1999. By 2005, this number is expected to increase to approximately 3.9 billion prescriptions.

Among the factors fueling this growth, are development of new medications and drug therapies, identification of new uses for existing medications, increased numbers of authorised prescribers, broader insurance for some selective medications, and direct marketing to the public by pharmaceutical companies. Not surprisingly, this growth has generated a corresponding demand for pharmacists in hospitals and clinics, as well as in retail, government, and academic settings. Because of workforce growth has not kept pace with the demand for services – due in part to the lack of growth in educational opportunities – a nationwide pharmacist shortage has developed.

 The Indian pharmaceutical industry has made significant contribution to the country and very correctly, India is called as "pharmacy of the world". However, in the last 90 years, this has happened at the cost of practice of pharmacy. The best quality medicines used inappropriately may lead to failure of achieving the desired outcomes. The first pharmacy college in the world - 'College de Pharmacie' - was established in Paris in 1777. In America, the Philadelphia College of Pharmacy was founded in 1821 followed by Massachusetts College of Pharmacy in 1823 and New York College of Pharmacy in 1829. India is one of the latecomers in the area of pharmacy education. The pharmacy education in India was started in Banaras Hindu University in 1932 by late ML Schroff, better known as "Father of Pharmacy in India". His initiative was well received by none other than Pandit Madan Mohan Malaviya, a national figure and vice chancellor of the Banaras Hindu University. In July 1937, the course was re-named as B.Pharm.; and, in April 1940, the first M. Pharm. course (as a research degree) was started in BHU.2 The available records confirm that before India gained independence in 1947, there were only 3 institutions offering pharmacy degree programs. As of a conservative estimate, the total number of pharmacy institutions in the countries stands over 2000 in 2021.According to Florence nightingale, 1957- “Nursing is an art, and it is to be made an art, requires as, exclusive devotion as hard a preparation, as any painter’s or sculptures work, for what is the having to do with dead canvas or cold marble compared with having the living body – the temple of God’s spirit? It is one of the fine arts, I had almost said the finest of finest arts”.

According to MC GEE Nursing as a Situationally derived system of nurse-client (individual, family or community) interaction that is based on the assessment of function and need and designed to optimise the client’s functional competence through:

1. Environmental modification;
2. Behavioural modification and/or enforcement; and
3. Biological care and maintenance using strategies of nursing care in appropriate dosage.

 According to International council of nurses “Nursing is a unique function of the nurse that is to assist the individual sick or well in the performance of those activities contributing to health or its recovery (or to peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge”.The American College of Clinical Pharmacy (ACCP) defines clinical pharmacy as an area of pharmacy concerned with the science and practice of rational medication use. According to ACCP “Clinical pharmacy is a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, and disease prevention. The practice of clinical pharmacy embraces the philosophy of pharmaceutical care, blending a caring orientation with specialized therapeutic knowledge, experience, and judgment to ensure optimal patient outcomes. As a discipline, clinical pharmacy also has an obligation to contribute to the generation of new knowledge that advances health and quality of life”.

The professional nurse and the pharmacist will be the one who recognises and understands the fundamental needs of the person, sick or well and who knows how these needs can met in a hierarchal way. They must possess a kind of discriminated judgement which will enable them to knowledge those activities, whichever falls within the area of their profession and those activities which have been identified within the fields of other professional or non-professional groups.

Pharmacology is an expansive subject ranging from understanding how drugs are administered, to where they travel in the body, to the actual responses produced. To learn the discipline well, nursing students need a firm understanding of concepts from various foundation areas such as anatomy and physiology, chemistry, microbiology, and pathophysiology. More than 10 000 brand name, generic, and combination agents are currently available. Each has its own characteristic set of therapeutic applications, interactions, side effects, and mechanisms of action. Many drugs are prescribed for more than one disease, and most produce multiple effects on the body. Further complicating the study of pharmacology is the fact that drugs may elicit different responses depending on individual client factors such as age, sex, body mass, health status, and genetics. Indeed, learning the applications of existing medications and staying current with new drugs introduced every year is an enormous challenge for the nurse. The task, however, is a critical one for both the client and the healthcare practitioner. If applied properly, drugs can dramatically improve quality of life. If applied improperly, the consequences can be devastating.

The fields of pharmacology and therapeutics are closely connected. Pharmacotherapy is the application of drugs to prevent disease and ease suffering. A thorough study of pharmacology is important to healthcare providers who prescribe or administer drugs. The provincial laws sometimes limit the kinds of drugs marketed and the methods used to dispense them, all nurses are directly involved with client care and are active in educating, managing, and monitoring the proper use of drugs. This applies not only for nurses in clinics, hospitals, and home healthcare settings, but also for nurses and pharmacists who teach and for new students entering in their profession. In all of these cases, a thorough knowledge of pharmacology is necessary for them to perform their duties. As nursing students progress toward their chosen specialty, pharmacology is at the core of client care and is integrated into every step of the nursing process. As new drugs and research findings emerge, nurses are challenged to evaluate the information and incorporate relevant knowledge into evidence-based practice. Another important area of study for the nurse, sometimes difficult to distinguish from pharmacology, is the study of therapeutics. Therapeutics is slightly different from the field of pharmacology, although the disciplines are closely connected. Therapeutics is the branch of medicine concerned with the prevention of disease and treatment of suffering. Pharmacotherapy, or pharmacotherapeutics, is the administration of drugs for the purpose of disease prevention or treatment and relief of suffering. Drugs are just one of many therapies available to the nurse for preventing or alleviating human suffering.

**Classification of Therapeutic Agents:**

 Therapeutic agents may be classified as traditional drugs, biologics, or natural health products. Substances applied for therapeutic purposes fall into one of the following three general categories:

1. Drugs or medications
2. Biologics
3. Natural health products.
4. **Drug or medications:**

A drug is a chemical agent capable of producing biological responses within the body. These responses may be desirable (therapeutic) or undesirable (adverse). A drug that is considered medically therapeutic is commonly referred to as a medication. Because drugs are defined so broadly, it is necessary to separate them from other substances that can alter the body’s biological activities, such as foods, household products, and cosmetics. Agents such as antiperspirants, sunscreens, toothpastes, and Fundamental Concepts and Principles of Pharmacology shampoos might alter the body’s biological activities, but they are not considered drugs or medications. Sometimes it is not clear whether a substance is a medication. For example, alcohol (beer, red wine) may be considered medically therapeutic when used in small amounts for cardiovascular effects, yet not be therapeutic when used in excess.

1. **Biologics:**

While most modern drugs are synthesized in a laboratory, biologics are agents naturally produced in animal cells, by microorganisms, or by the body itself. Examples of biologics include hormones, monoclonal antibodies, natural blood products and components, interferon, and vaccines. Biologics are used to treat a wide variety of illnesses and conditions.

1. **Natural health products:**

Other therapeutic approaches include natural health products (NHPs) and complementary and alternative therapies. NHPs may include natural plant extracts, herbals, vitamins, minerals, and dietary supplements. Complementary and alternative therapies include therapies such as acupuncture, hypnosis, biofeedback, and massage. Because of their growing popularity, herbal and alternative therapies are featured throughout this text. It is important to ensure that information related to home herbal remedies is shared with medical professionals, to ensure that the client does not receive two different forms of the same drug or drugs that may counteract the home remedy. The nurse should support the client by facilitating an open discussion on the client’s intent to use herbal remedy with the physician. This will make the client feel involved in the decisions related to his or her care. Remind the client that the herbs may interfere with current medications that he or she is taking.

1. **FUTURISTIC TRENDS IN PHARMACY**

**1.THE PROFESSION “PHARMACY”:**

1. **A SPOT LIGHT ON PHARMACOLOGY:**

**Brief introduction:**

Pharmacology is derived from two Greek words: **“Pharmakon”** means drug and **“Logos”** means study.

**Clinical Pharmacology** is the study of drugs in humans. It includes the pharmacokinetic (action of drug on body) & pharmacodynamic(effect) studies of drugs in humans. It is useful for rational prescription of drugs.

**Drug** is defined as an agent used for the diagnosis, mitigation, treatment, cure or prevention of diseases in humans & animals.

Earlier it was focused as “PHARMACY” a ‘INSTITUTION’, rather the development projects it has dual role like a Community Pharmacist as a entrepreneur person and was juxtaposed to a healthcare Professional.

 **Fig 1:** [**Pharmacology**](https://www.slideshare.net/BikashAdhikari26/pharmacology-103715060#2) **Subdivisions**

[**Pharmacology has two**](https://www.slideshare.net/BikashAdhikari26/pharmacology-103715060#2)**main subdivisions:**

**Pharmacokinetics** (what body does to drugs?)

Pharmacokinetics is the study of process by which a drug is absorbed, distributed, metabolized & eliminated by the body.

 **Fig 2: Pharmacokinetic process in body**

**ABSORPTION:**

The process of a liquid, gas or other substance being taken in. Absorption is the journey of a drug travelling from the site of administration to the site of action. The drug travels by some route of administration (oral, topical-dermal, etc.) in a chosen dosage form (e.g., tablets, capsules, or in solution). Absorption is very important aspect of pharmacokinetic study of drug The Knowledge of absorption helps us to decide route of administration and gives us idea about bioavailability of drug which in turn helps us in deciding the dose. Pharmaceutical industry utilises knowledge of absorption to prepare different formulation

Goodman and Gilman defined absorption as “Absorption is the movement of a drug from its site of administration into the central compartment ...and the extent to which this occurs". Rang and Dale defined as, "Absorption is defined as the passage of a drug from its site of administration into the plasma". Specific definition in chemistry says, “Absorption is the physical phenomenon of one substance's atoms, molecules or ions entering a bulk phase, be it solid liquid or gaseous". General Definition: “Movement of unchanged drug from site of administration to systemic circulation”.

**DISTRIBUTION:**

Drug distribution is the disbursement of an unmetabolized drug as it moves through the body's blood and tissues. The efficacy or toxicity of a drug depends on the distribution in specific tissues and in part explains the lack of correlation between plasma levels and the effects that are seen.

**METABOLISM:**

Drug metabolism is the term used to describe the biotransformation of pharmaceutical substances in the body so that they can be eliminated more easily. The majority of metabolic processes that involve drugs occur in the liver, as the enzymes that facilitate the reactions are concentrated there.

**ELIMINATION:**

Drug elimination means the irreversible movement of drug in the body.

**Pharmacodynamics** (what the drug does inside the body?)

Pharmacodynamics is the study of interaction of drug and receptors responsible for the action in the body.

**Fig 3: Pharmacodynamic Action**

1. **THE FUTURE OF PHARMACY:**

As per the Canadian Pharmacists Association in 2008 said that the major concern for the futuristic pharmacy professionals are Loss of autonomy and De-professionalisation. The Fifth Community Pharmacy Agreement in 2010 stated that the majority of pharmacists still prefer the status quo, with dispensing as their main professional activity.

The Indian market witnessed a significant setback due to the outbreak of COVID-19. The growth of the Indian pharmaceutical industry was largely supported by government initiatives and programs. The COVID-19 flare-up also provided an opportunity for Indian pharmaceutical organizations to transform into a supported trade point for gathering drugs and intermediates. In April 2020, as the crisis deepened on a global level, the country lifted the restrictions on the export of 24 pharmaceutical ingredients and medicines. With the sudden emergence of COVID-19, there was a high and growing demand for vaccines as one of the most effective tools to protect against infectious diseases.

 The global picture of the place of community pharmacy as an institution is also rather varied. In some parts of the world, pharmacy has been gaining a foothold, as it is seen in the USA. Conversely, relatively strong professional systems have been dismantled and restructured where pharmacy has moved to a more commercial identity[7]..

Proactive pharmacy is Bromley-by-Bow in London; an NHS walk-in centre is co-located with a green-light pharmacy, and the walk-in centre pharmacists triage people who do not need to see a doctor or nurse, can reach the pharmacy for advice and self-care

 

**Fig 4: Proactive pharmacy is Bromley-by-Bow in London**

In India, some regions have a structured government intervention by way of the existing Free Trade Agreements (FTAs) like the South Asian Free Trade Area (SAFTA), Japan-India Comprehensive Economic Partnership Agreement (CEPA), Association of Southeast Asian Nations (ASEAN) Trade in goods agreement, can benefit Indian pharma companies to leverage such markets with customised therapeutic offerings. Regions working towards reducing the healthcare costs and with the upcoming patent cliff opportunity across formulations both chemical and biologics, could boost growth, create newer export corridors for Indian companies. Collaboration play (likes of GAVI for vaccine) with international regulatory bodies like International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH) and Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme (PIC/S) would also facilitate access to these markets.

COVID-19 has clearly highlighted the importance of a strong health care system, the lack of which can put an entire nation’s economy and society at risk. As India continues to fight COVID-19 and stabilize its economic growth trajectory, it is the right time for the country to apply learnings from the challenges and best practices that emerged during the pandemic. There is a need to swiftly develop the required healthcare infrastructure and make it available to the entire population. The Indian pharma industry has been a key contributor in improving the country’s healthcare and economic outcomes.

The pandemic has accelerated several opportunities and challenges for the industry. While the growing trust deficit with China presents an opportunity for India, there is increasing competition from other countries, such as Vietnam and Malaysia. India is also dependent on China for ~two third of its imports of bulk drugs or drug intermediaries. To emerge as a winner in the post-pandemic world, the industry needs to continue building on its strength and at the same time make a giant leap towards innovation. New capabilities need to be introduced across the business functions to bring efficiencies and to help industry move up the value chain.

Government also needs to provide the right enablers and business environment conducive for growth. In this book, we discuss the opportunities, challenges and the way forward for the country to achieve the ambition of equitable and sustainable access to healthcare. It also provides an insight for the industry to achieve the ambition of becoming the preferred global supplier of innovative medicines. This is an opportunity for the Indian pharma industry to consolidate on its advantages and undertake fundamental reforms to reignite innovation-led industrial growth to meet the target ofUS$130b by 2030[5,8].

1. **THE CHALLENGES AND OPPORTUNITIES OF FUTURE PHARMA in India:**
2. **Need for Expansion Beyond Generics:**

Exploring opportunities in biosimilars and New Chemical Entities (NCEs) of Indian companies are involved in the following Research & Developmental models and have developed globally competitive expertise in some areas. Generics Research & Development in generics has been a traditional focus area for most of the India-based pharma companies. India’s dominant share in the overall Abbreviated New Drug Application (ANDA) approvals and the first-time ANDA approvals by the U.S Food and Drug Administration (USFDA) is a good reflection of the country’s strength in the global generics market.

Indian companies received over 35% of total ANDA approvals between 2010 to 2019 (2,046 of the total 5,768 ANDA approvals) with their share of annual ANDA approvals increasing from 34% in 2010 to over 40% in 2019. Similarly, in the last few years, Indian companies have overtaken US generics firms, receiving the largest number of first-time ANDA approvals. India’s share in the first-time ANDA approvals increased from 29% in 2016 to 33% in 2019.

1. **Need for New chemical entities (NCEs) and new biological entities (NBEs):**

These products are the major focus for leading multinational pharma companies. Indian companies are beginning to improve their in-house novel drug development with the aim of launching new blockbusters. Developing NCEs and NBEs put Indian companies in direct competition with global innovators. Some of the large Indian pharma companies, such as Zydus, Glenmark, and Sun, as well as clinical research organizations (CROs) and contract development and manufacturing organizations (CDMOs) are already engaged in researching new drugs.

For eg. Biocon was the first company to launch indigenously developed novel biologics in India. The company launched BIOMab EGFR for Head And Neck cancer treatment in 2006, and Alzumab (itolizumab) for psoriasis treatment in 2013. Both these novel monoclonal antibodies have been launched in several countries in collaboration with global companies.

Novel drug development promises high returns, but it also requires high investment of time and resources. While Indian companies have started the journey, there is a need to build a strategic approach in order to move from incremental innovation to becoming a global player in innovative drug

 For eg. Cell and Gene Therapy (CGT): assessing current landscape and exploring future potential with only 1.4% of the world’s clinical trials being carried out in the country, India has traditionally lagged behind other countries in terms of early clinical development. It has entered the CGT space recently. Most CGTs in the early stages. The Research Institutions, such as the Indian Institute of Technology (IIT), Bombay and Tata Memorial Center, Mumbai are developing chimeric antigen receptor CAR-T cell technology platforms. Biogen has invested in Immuneel to bring CAR-T therapy in India.

**3.** **Need for innovation mindset and related skill augmentation:**

Biomedical research encompasses basic research, translational research, pre-clinical research and clinical research. All these areas of research need to be tied together through collaboration between scientists involved in basic research, biomedical experts and clinicians.

**4. Need for increased alignment between academic curricula and industry needs:**

 In addition to the limited availability of talent, there is also a misalignment between the industry needs and academic curricula in the Indian universities – a huge adaptation happens both in terms of the curriculum and exposure to the real-world needs. As a result, most talent coming out of the educational institutions is not ready for the demands of the pharma industry. In the fore-coming years, it requires special attention to strengthen it.

**5. Need to enhance the infrastructure to a global standard:**

 Due to the limited infrastructure and opportunities, students often seek universities outside India for further studies, especially in science and technology fields. In 2018, more than 750,000 Indian students were studying abroad and about 28% of these students went to the United States of America. India is the second largest place of origin for international students for the US with about 18% of all international students in the year 2018-19 originating from India (China is the top place with 34% of the US international students originating from the country). More than 70% of Indian students in the US are already in practice. However, the actual issue is not studying abroad.

The challenge is that the majority of these students find jobs overseas and never return to India, resulting in ongoing loss of the country’s intellectual capital. By contrast, China contributes to the largest share of international students in popular study-abroad destinations (including the US and the UK), but about 8 of every 10 Chinese students choose to return to China after graduation. This trend, increasingly pronounced in the past 3-4 years, can be attributed to China’s favourable domestic policies towards returnees and their advantages in the country’s job market.

**2.THE CHALLENGES IN THE PHARMA PRACTICE:**

A deeper look at the prevailing pharmacy practice in the country shall reveal that the pharmacy practice in the country is growing - in clusters. While the markers of service quality and performance indicators are in place for many other professions, the gap for pharmacy seems to be larger and the impact is killing. Mere availability of Good Pharmacy Practices guidelines does not necessarily translate into better quality of service.

**T**HE SIX ISSUES IDENTIFIED TO BE CHALLENGES TO THE GROWTH OF PHARMACY PRACTICE IN THE COUNTRY ARE ENUMERATED.

**FIG 5: THE SIX CHALLENGES IN THE PHARMACY FIELD**

1. **Availability of well-equipped teachers:**

 Practice of pharmacy cannot progress without learning the skills. And, acquiring skills is not possible without training. We have, most of the times, not been able to distinguish between 'qualified' and 'trained' personnel in work areas. And, this has meant that the qualified personnel slowly acquire the functional skills. This pace is not acceptable for growth of pharmacy practice in our country. The issue is compounded by the mushrooming growth of colleges offering B.Pharm courses. Exceptions apart, the teachers have never been into a practice environment.

The treatment of subject like hospital/ clinical pharmacy is insipid and disoriented. The result is lack of clarity to the young minds on what is the practice of pharmacy. A contrast to consider is the law school where the learners have clarity on their future roles. In academia, it is assumed that those who can teach certain subjects (clinical pharmacy, pharmacotherapeutics, EBM and so forth) will become exceptional pharmacy practice teachers/instructors. This belief has only led to creation of a pool of teachers who have completed a certain number of mandated hours of training in pharmacy practice. Essentially, it helps to meet the regulatory requirement and does not contribute to improve the quality. The author has flagged and underlined this gap in the year 2004.

1. **Demonstration and practice of newer skills:**

Lack of skills (identifying the pulse/ injecting insulin to a family member) is yet another important factor that keeps the pharmacy students away from the areas of practice. It is a matter of common knowledge that a pharmacy graduate can elaborate to a large length upon the pharmacology of critical medicines Eg. Digoxin. The most important fact was that the student may not be able to identify a case of any minimal life-threatening issues Eg. cyanosis in the neighbourhood / or in a workplace. And, it’s not about more serious events like angina attack, Congestive Heart Failure or stroke. Personal experiences reaffirm the belief in the capability of the diploma in pharmacy students, who do much better in such situations. The difference is solely because of the training that they undergo. The lack of training in life-saving skills, lack of knowledge of the dosage forms, no exposure to use of some simple devices only adds to the problems.

To improve the practice of pharmacy, there is a need to build a stronger skill set at the younger level. In light of these, it is advisable that each pharmacy institution should divert their resources towards 'real-time' training of students. The starting point could be as simple as identification and/or use of a hypodermic needle. This shall be easier to do with 'trained' teachers at the pharmacy schools.

**c) Networking among the institutions**

It is to be noted that individual institutions are promoting the practice of pharmacy through established frameworks. In this context, it keeps a lot of relevance that institutions within the nation or internationally with similar interests go for networking. The informal framework networking & collaboration does not seem to be working well. And, the decision makers invest 'much more than needed' time and energies to get into the formal framework for networking. For instance, the effort to conduct studies on utilization of medicines or more specifically antimicrobial agents.

Several research groups/ institutions are working on this in our country; however, the protocols adopted are divergent. The academic proficiency is excellent when viewed 'individually'. The cynicism is that the results do not add to wisdom on the matter. It is very much in order, at this point, to mention that World Health Organization has standardized protocols in the open domain on multiple areas. In a developing country like ours, numbers are an inherent advantage. The institutions/ research groups working on a common theme need to adopt a 'common' experimental protocol so that at the completion of the study, one can -at least understand the differences in the patterns of consumption of medicines at different locations. The author believes that there is an intense need for research groups to work more closely.

**d) Involvement with the community:**

 The choice of pharmacy graduates is given lesser chances to get practice as a pharmacist, given the poor compensation and still poorer acknowledgement. In the last decade, the concept of 'compounder' has not faded off the minds of people in India. Even though this notion finds its roots in the fact that the pharmacy students lack their basic skills, this adds to lack of identification as a pharmacist. It is a delay to response that some institutions have started to put up camps for the benefit of their community.

The people in the community and in health care facilities must be given a clear solution for their concerns. Their concerns are intuitive like- what could be done in case of missed regular medications? What must be avoided while taking certain medications? Can the given medication dose be adjusted based on the symptoms? When pharmacy students are unable to answer these points with confidence and clarity, the people shall continue to look for solutions by asking with the peer group or use internet to find out the answers. Since the quality of information available on internet is doubtful many a times, the window of opportunity lies here. Of special interest are the elderly patients who receive multiple medications and have all the time plus willingness to know more about the medicines they are on. As India grows, the number of elderly people is going to swell and a special cadre of 'geriatric pharmacists' is on the horizon [1,2,3].

**e) Lack of robust and closer interaction with the health care team:**

 The prowess clinicians are exceptional when it comes to the management of disorders. There are many instances when a medicine is not required at all. The wiser pharmacists understand their domain of having expertise in pharmacokinetic principles, pharmacology of drugs and the pharmaceutical business. As long as the pharmacists maintain their boundaries, the clinicians and nurses are very comfortable working together. The pharmacists need to understand the implications of issues around ethical principles of biomedical research. Which need to be adhered strictly while working with clinicians, nurses and with human participants. As Partakers with clinicians it requires perseverance. The understanding of the canvas in which they operate is equally critical. Presently, many pharmacy schools do not address this. The best route that the practicing pharmacists can take is to start as backend support to the clinical process. A word of caution here - Jumping the line and getting into interacting with patients or with the care providers can cause long term damage.

**f) Sensitization of the younger students:**

With the above in view, no doubt that within India there are a variety of explanations of pharmacy practice. Someone capturing data on a set of patients and bringing out some statistics from that data-set could claim to be working in the domain of pharmacy practice. Such enthusiasm of some researchers is causing more damage to the total scenario. It is, therefore, very much appropriate that those who have been themselves in the professional practice of pharmacy use their wisdom and judgement to sensitize the younger students at colleges and even pharmacy colleges. While PowerPoint presentations are an accepted standard for any presentation in the current times, it shall make an entirely different impact if examples from the 'real-world' setting are shared with the younger and inquisitive minds. Larger and established schools of pharmacy practice have a greater responsibility and they are well-positioned to address this. In conclusion, it shall suffice to say that the growth and advancement of the pharmaceutical industry needs to continue. And, there is a big scope for the practice of pharmacy to improve in India. The author understands that there could be many other factors that have a role to play. However, this viewpoint is absolutely personal and the understanding of the reader is solicited [4,13].

1. **FUTURISTIC TRENDS IN NURSING**

**1. THE PROFESSION “NURSING”**

1. **A SPOT LIGHT ON NURSING:**

[Nursing is](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#2)a profession with good career opportunities that changes and reflect the society in which nurse live. The call on nurses, individually and as a profession, to embrace changes needed to promote health, prevent illness, and care for people in all settings across the lifespan. The nursing profession cannot make these demanded changes on its own. However, the report calls for multisector support and interprofessional collaboration. In this sense, it calls on all health professionals like pharmacist and other health care decision makers to work with nurses to make the changes needed for a more accessible, cost-effective, and high-quality health care system. The history of nursing spans from the history of human kind. For as long as there has been life, there has been the need to provide care and comfort to those suffering from illness and injury. From the dawn of civilization, evidence prevails to support the premise that nurturing has been essential to the preservation of life. Survival of the human race, therefore, is in inextricably intertwined with the development of nursing. Nursing has been called the oldest of the arts and the youngest of the profession. The word nurse evolved from the Latin word nutritious, which means nourishing

1. **CONCEPT:**

The word concept means an idea or general notion. So, the concept of nursing means the idea or mental image of nursing.

* Nursing has its own body of knowledge scientifically based and humanitarianism that promises expanded benefits to people and society.
* It assists the individual or family to achieve their potential for self-direction for health.
* Skillful nursing care embraces the whole person, body, mind and soul, his physical, mental, social and spiritual well-being (holistic approach).
* In its broadest sense, nursing covers not only the care of the sick, the aged, the helpless and the handicapped, but also cares for the promotion of health and prevention of illness.
* The arts of nursing had its birth in the earliest home where a mother cared for the well-being of the rest members of the family.
* It is this mother care that through the ages developed into a skilled art and a well-organized science.
* It will be interesting to know and understand the vast changes that nursing has passed through, in order to meet the needs of a changing civilization.
* A study of the development of nursing will throw light on some of the problems of the past, how they have been solved and how nursing has progressed rapidly despite various hindrances.
* The paternal and maternal instinct in a human being is the main source of the nursing impulse, and is found in the hearts of people of all ages. A mother's care for her sick child always found expression in such acts to alleviate pain and help the child to get better.
* In a society, the noblest forms of humanitarianism are showing mercy, love and kindness to those in physical or mental distress. When this impulse or motive is re-enforced by religious philosophies and beliefs, it inspires people to live a life of service and of self-sacrifice for the sake of others.
* Along with this spirit, special training and experience has made nursing an ideal and useful profession.
1. **DIFFERENT FIELD IN NURSING**

**Fig 6: The Different Fields in Nursing**

Career opportunities are more varied now for a numbers of reasons. The list of other opportunities available are :

**1. Staff Nurse**:

Provides direct patient care to one patient or a group of patients. Assists ward management and supervision. She is directly responsible to the ward supervisor.

**2. Ward sister or Nursing Supervisor**:

 she is responsible to the nursing superintendent for the nursing care management of a ward or unit. Takes full charge of the ward. Assigns work to nursing and non-nursing personnel working in the ward. Responsible for safety and comfort of patients in the ward. Provides teaching sessions if it is a teaching hospital.

**3.** **Department supervisor/Assistant Nursing**

Superintendent. She is responsible to the nursing superintendent and deputy nursing superintendent for the nursing care and management of more than one ward or unit. Example – Surgical department. Out-patient department.

**4**. **Deputy nursing superintendent**.

She is responsible to the nursing superintendent and assists in the nursing administration of the hospital.

**5.Nursing Superintendent** She is responsible to the medical superintendent for safe and efficient management of hospital nursing services.

**6. Director of Nursing** She is responsible for both nursing service and nursing educations within a teaching hospital.

**7. Community Health Nurse (CHN)** services rendered mainly focusing Reproductive Child Health programme.

**8. Teaching in nursing.** The functions and responsibilities of the teacher in nursing are planning, teaching and supervising the learning experiences for the students. Positions in nursing education are clinical instructor, tutor, senior tutor, lecturer, and associate professor, Reader in nursing and Professor in nursing.

**9. Industrial nurse** Industrial nurses are providing first aid, care during illness, health educations about industrial hazards and prevention of accidents.

**10. Military Nurse**. Military Nursing service became a part of the Indian Army by which means nurses became commissioned officers who are given rank from lieutenant to major general.

**11.Nursing service abroad** Attractive salaries and promising professional opportunities, which causes a major increase for nursing service in abroad.

**12. Nursing service Administrative positions**.

At the state level the Deputy Director of Nursing at the state health directorate. The highest administrative position on a national level is the Nursing Advisor to the Govt. of India.

1. **PHILOSOPHY OF NURSING:**
* Nursing care is the person to person application of scientific principles for the sake of achieving therapeutic purpose for patients and for the sake of their health maintain and the prevention of illness.
* It has been suggested that the nursing should be defined in terms of clinical skills that the nurse’s use in attempts to maintain life, restore health, and prevent disease, which are now used in determining the professional practice.
* A unification of some common philosophical elements for all types of nursing make a sense of the work and nursing a place in that world.
* Providing of comprehensive care to the patients.
* Commitment to establish and maintain an exceptional relationship of caring for and about individuals wherever we encounter them in the health continuum.
1. **HISTORY OF NURSING**

It is a very noble profession. Nurse play an important role during the treatment process of patients and thus help mitigate their suffering and ailment. Besides rendering various types of professions pertaining to their profession, they also have healing touch to the patient through their gentle and affectionate behaviour

1. **Pre-Historic Nursing**

**Pre- Christian time or nursing in early civilization**

Nursing have an independent origin the first mother was the first nurse, each method in a home is basically doing many nursing functions knowingly or unknowingly. The nursing needs of the sick at home were met and continues to be met by the family members.

Actually, there is no record of nursing care during ancient time. We hear about nursing through might songs and also from the findings of archaeologist pre-historic mans in the mysteries of life, birth, disease and death.

* The pre-historic man believed in god and evil spirit. Diseases were caused by the evil spirit. They used to punish the body to get rid of evil spirits by fasting and beating.
* The magician used boating to cast out the evil spirit by giving nauseated medicine, making loud noise and by beating the body; later these magicians become the priest physician.
* Black magics are used to attract evil spirit or to bring harm to one’s enemies while white magic was used to attract good or helpful spirit.
* During primitive period they practiced massaging fomentation, trephining bone setting amputation, hot and cold water, bags abdominal operations and applications of heat to control haemorrhage.
* Knowledge as the art of caring nourishing and cleansing was passed down from generation to generation. The present practice in nourishing has devoted slowly over a long period of time.
* The art of healing began thousands of years ago. People try to please the gods by prayers, metals, and sacrifices. They practiced magic and witchcraft.
* When writing became the possible history began to recorded or inscriptions on tablets and in books. Archaeological findings and scripture provide material on the contribution of ancient civilization.
* **Sumerian Civilization**

They had their own medical skills and burial systems. The priest worshipped evil spirits or god and built temples to them to please them so that diseases and misfortune would be eradicated.

* **Babylonian Civilization**

They offered, sacrifices of human blood to their god to please them. The priest physician was given a highest place than surgeon. They believed that the illness was caused by sin and anger of god. Temples becomes centres of health and medical care.

* **Egyptian Civilization**

The oldest medical records, dated back to 1600 BC have from Egypt. These were written on papers and have been preserved.

Egyptians believed in life after death. They practiced the art of embalming and bandaging called mummification. An embalmed body is called mummy.

* **Hebrew Civilization**

 Hebrews oldest book is the old testament of the bible, Moses was their divine leader, a descent of god. They had health inspector high priest hospitals, and hostels. They practiced hospitality nursing and public health nursing.

* **Ancient Civilization**

The priest sweats, baths they had soothsayers, medical advisers and pharmacist. They practiced human sacrifices to god. They practiced sand paintings for healings, they used herbal medicine.

* **Chinese Culture:**

Dissection was practiced in china before 200BC also their slogan was look listen ask feel. They practiced vaccination as early as 1000BC practiced tea drinking as a precaution against intestinal infections. Women had inferior position in china.

* **Indian Civilization:**

The earliest records of Indian medicine are seen in “Vedas”. The “Ayurveda” has been given by Brahma. It Includes Medicine Surgery in India. Sushruta is the father of surgery, in India.

* **Greek Civilization:**

 The Greeks provided medical leadership in the theory and practice of clinical medicine and clinical instruction. Hippocrates is the father of modern medicine. Roman civilization: roman practiced the system of medicine of Greek.

**NURSING IN THE 15-17TH CENTURY:**

The lack of hygiene and sanitation and the increasing poverty in urban counters resulted in serious problem in health care.

The sisters of charity established in the 16th century by Louis de Gras, was the first nursing order with a systemic dun educational programme. Soon after the French colonies were established in Canada, the Augustinian sisters arrived to hospitals and provide care for sick

**NURSING IN THE 18-19thCENTURY:**

 In the eighteenth century the growth of cities brought an increase in the number of hospitals and a greater role for nurses. The small pox epidemics in the French colonies and the revolutionary war in the English colonies increased the need for nursing services

In the 19th century Florence nightingale brought about major reform including the provision of cleanliness and comfort the provision of cleanliness and comfort in hospitals meeting the basic needs of the ill and the education of the ill and their families about health promotion.

**NURSING IN THE 21ST CENTURY**: -

For the nursing graduate, the future holds numerous social, political and technological changes. During the 21st century, societies will continue to move towards globalization with an increased sharing of products, attitudes and financial investments. The clients may be more likely to combine conventional therapies with complementary healing techniques.

**Fig 7: Conventional Therapies and Complementary Healing Techniques**

**FLORENCE NIGHTINGALE:**

Florence Nightingale was born in a wealthy English family, on 12th May 1820. As she grew off, she became interested in people and in politics. She had great desire to become a nurse though her parents were not keen on her becoming one.

She was dissatisfied with the dealt routine lifestyle of the upper-class women of their days. She had an active mind and an interest in her surroundings beyond household and socials events. She has received a classical education equal to that of men of her day. This education provided her with an understanding of the circumstances of the world in which she lived. It makes her aware of the inadequate care being provided in hospitals, when she accompanied her mother on visits to the ill. What Nightingale saw in the hospitals intrigued her and made her want to become more involved.

Nightingale learned about the school at Kaisers worth and in1850, she was admitted to the training program. The three years of training she received were rigorous but helped her clarify what was lacking in the current training of English nursesle, the heroine of the Crimean war, the refocused of the administration in military and civil hospitals and public hygiene was the founder of modern professional nursing.

 At this time, she helped them to write letters to their families and last messages for those who were dying. She was rightly known as **“The Lady with the Lamp”.**  Florence Nightingale was the most important writer in the field of nursing and public health nursing. She was born on May 12,1820 in Florence, Italy. She was a progressive leader of the Femina movement, where intelligent mind was far in advance of the time and where warm motherly heart enabled her to dedicate herself to her profession the greatest devotion. In 1855, she contacted Crimean fever after her recovery in 1856 peace was declared and hospitals at secularly were closed. She returned to England.

**CIVIL WAR -18th CENTURY:**

The civil war (1860-1865) stimulated the growth of nursing in the US nursing in hospital expanded in the late 19th, 20th and in early 20th century movements towards a scientific research based on body of nursing knowledge and practice was seen Nurses began to assume expanded and advanced practices roles many Adelaide nutting because the first professor of nursing in Columbia university

**NATIONAL COMMISSION ON NURSING:**

In 1965 the National Commission nursing education explored issues that included the supply of and demand for nurses, classification of nursing role and function, education of nurse and opportunities available to nurse.

**MILITARY NURSING IN INDIA:**

* Military nursing was the earliest type, of nursing in India. First hospital for soldiers in India was started by the by the east india company in 1664 at fort St. George madras.
* In 1861 reform in military hospital were carried out all over the world of her the reform of Florence nightingale
* In 1854 a framing school was started in modern for midwifery, earlier military nursing was carried out by orderlies and the nursing staff.

**CIVILIAN HOSPITAL:** The first civilian hospital was the government general hospital of nature and the nursing training started.

PRIVATE MISSION HOSPITAL: the leading hospital and training center at vellore and madras wherever Christians and Christian missionaries are settled, they have started private nursing colleges schools and hospitals.

1. **NURSING AS A PROFESSION**

**PROFESSION:**

Profession has been defined as that extensive education or a calling that requires special knowledge, skill and preparation. It is an occupation with moral principles that are devoted to the human and social welfare. Professional nursing is a service devoted to the promotion of human and social welfare.

**PROFESSIONALISM:**

It refers to professional character, spirit or methods. It is a set of attributes, a way of life that implies responsibility and commitment.

**PROFESSIONAL NURSE:**

It is a health worker, a graduate from a recognized school who is identified by law as registered nurse whether graduated from baccalaureate (BSc) or a diploma program.

**CRITERIA FOR PROFESSION**

 o

**Fig 8: Criteria for A Profession**

**THE CHARACTERISTICS OF A PROFESSIONAL NURSE:**

1. Good physical and mental health
2. Truthful and efficient in technical competence.
3. Cleanliness, tidy, neat and well groomed.
4. Confidence in others and itself.
5. Intelligence
6. Open minded, cooperative, responsible, able to develop good interpersonal relations.
7. Leadership quality.
8. Positive attitude
9. Self-belief towards human care and cure.
10. Convey cooperative, responsible, able to develop good interpersonal relations.

**PROFESSIONAL EQUITIES:**

1. Be gentle and polite in talk
2. Greet seniors, co-workers, and patients.
3. Keep dress neat and tidy.
4. Help the seniors to carry a heavy load if they are in the way.
5. Be punctual always
6. Keep eye contact and sit face to face when listening to some one
7. Knock at the door and wait for the answer before entering into a room
8. Excuse before interfering with others talk or work
9. Don’t give and receive any gifts or present especially from the patients and their relatives.
10. **FUTURE TRENDS IN NURSING**

The Future of Nursing report was issued by the Institute of Medicine, the world has come to understand the critical importance of health to all aspects of life, particularly the relationship among what are termed social determinants of health, health equity, and health outcomes. In a year that was designated to honor and uplift nursing (the International Year of the Nurse and the Midwife 2020), nurses have been placed in unimaginable circumstances by the COVID-19 pandemic. The decade ahead will demand a stronger, more diversified nursing workforce that is prepared to provide care; promote health and well-being among nurses, individuals, and communities; and address the systemic inequities that have fuelled wide and persistent health disparities.

The vision of the Committee on the Future of Nursing 2020–2030, which informs this report, is the achievement of health equity in the United States built on strengthened nursing capacity and expertise. By leveraging these attributes, nursing will help to create and contribute comprehensively to equitable public health and health care systems that are designed to work for everyone. To achieve health equity, the committee also envisions a major role for the nursing profession in engaging in the complex work of aligning public health, health care, social services, and public policies to eliminate health disparities and achieve health equity. Specifically, with implementation of this report’s recommendations, the committee envisions 10 outcomes that position the nursing profession to contribute meaningfully to achieving health equity.

The Future trends of Nursing are;

* Service (practice) education
* Practice (nursing care)
* Research Administration
* Clinical nurse specialist {C.N.S}
* Nurse practitioner {N.P}
* academic administration
* Adult nurse practitioner
* Family nurse practitioner
* Master’s education
* Acute care nurse practitioner
* Doctoral programs in nursing
* Geriatric nurse practitioner
* Bachelor of Science in management/ Paediatric nurse practitioner health care.
* Women’s health nurse practitioner
* Certificate in Forensic Nursing
* Certificate in legal nurse consulting
* Certified nurse midwife (C.N.M.)
* Certified registered nurse anaesthetist (C.R.N.A.) administration

OTHER AREAS OF FUTURISTIC NURSING ARE:

 1. Mobile nursing / Health care Education

 2. Space nursing Certified nurse practitioner

3. Licensed practical nurse

4. Arrow nursing

5. Masters of science in nursing/ Masters of health administration.

 **SERVICE (PRACTICE) EDUCATION:**

Because of increasing educational opportunities for nurses, the growth of nursing as a profession, and a greater concern for job enrichment. It includes three broader areas: -

**Fig 9: The Areas of Service Education**

**PRACTICE (NURSING CARE):**

Graduate education prepares nurses for advanced practice in a variety of specialized roles in primary, secondary and tertiary settings. In facilities like Hospitals, Clinics, Colleges, Community settings, Public Health Centres etc.

**CLINICAL NURSE SPECIALIST: -**

* She/ he is an Advanced Practice Nurse with nursing expertise in a specialized area of practice and may work in any practice setting.
* She/ he may also assume administrative and management roles.
* She/ he can function as an Expert Clinician, Educator, Case Manager, Consultant and Researcher to plan and improve quality of care provided to the client and family.

 [The Clinical Nurse Specialist should](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#12) have following eight characteristics: -

**1. Clinical Judgment**

Clinical judgment refers to the process by which nurses make decisions based on nursing knowledge (evidence, theories, ways/patterns of knowing), other disciplinary knowledge, critical thinking, and clinical reasoning.

E.g. Ongoing evaluative reflection to monitor a patient's response

**2. Clinical Inquiry**

Clinical inquiry is the practice of asking about medical procedures and information to gain knowledge and improve patient care. E.g. Internal Skill Training like BLS and ACLS.

**3. Facilitator of Learning**

A facilitator of learning is a teacher who does not operate under the traditional concept of teaching, but rather is meant to guide and assist students in learning for themselves.

E.g, Objective Structured Clinical Examination (OSCE) and Objective Structured Practical Examination (OSPE).

**4. Collaboration**

It refers to joint efforts between various independent teams or groups. For example, if a pregnant patient shows signs of a heart issue, a cardiac arrest.

**5. Systems thinking**

Systems thinking helps provide better patient-centered care, fosters problem-solving and encourages questioning.

 For instance, a physician who is discharging a female patient with diabetes from a hospital stay related to blood-sugar control helps the patient by making sure she has support in place to follow the care plan, consulting with the patient’s nurse care manager and contacting the patient’s primary care physician to provide a copy of the discharge plan.

**6. Advocacy or moral agency**

It is an ability to make decision which is wrong or right.

**7. Caring practices**

Nursing care has been wide spreaded from patient care to family centered care and then to community centered care.

**NURSE PRACTITIONER:**

Nurse Practitioner provides health care to clients usually in an outpatient, ambulatory care, or community-based setting. Nurse provides care to the clients with complex problems and provide a more holistic approach, attending to symptoms of non-pathologic conditions, comfort and comprehensiveness of care. Nurse Practitioner have legal authority to implement patient management by ordering diagnostic tests and treatments and prescribing medications.

1. [**Adult nurse**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#14)**practitioner (A.N.P.):**

They provide primary, ambulatory care to adults with a non-emergent acute or chronic illness and in some settings tertiary care. The role includes case management, consultation, leadership, education, research and health policy development.

1. **Family Nurse Practitioner (F.N.P):**

They provide primary ambulatory care for families, usually in collaboration with a family care physician. It meets the family’s health care needs, manages some illness by providing direct care, and guides or counsels the family as needed.

1. [**Acute Care**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#15)**Nurse Practitioner (A.C.N.P):**

He\She is a registered nurse with a graduate degree in nursing who is prepared for advanced practice using a collaborative model to provide direct services to adult patients who are acutely or critically ill in a variety of setting such as hospital or specialty clinic. The A.C.N.P. is a generalist, usually based in internal medicine, focusing on the care of the hospitalized patient.

 [**d) Geriatric Nurse**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#16)**Practitioner (G.N.P.):**

 G.N. P’s are trained in the specialized needs of the ageing adults, with emphasis on health promotion, health maintenance and functional status. Age of the client is usually 65 and older.

 **e) Paediatric Nurse Practitioner (P.N.P.):**

 P.N.P. provides specialty care for children from birth to 21 years of age. P.N. P’s practice in hospital ambulatory care, emergency care and physicians’ offices.

 **f) Women’s Health Nurse Practitioner (W.H.N.P.):** Theyprovides ambulatory care to womb

**CERTIFIED NURSE MIDWIFE (C.N.M)**

Clinical Nurse Midwife is a registered nurse who has advanced educational preparation in midwifery which includes theory and extensive supervised clinical experiences in prenatal care, management of labor and delivery, postpartum care of the mother and the infant, family planning, pap smears and treatment for vaginal infections. Clinical Nurse Midwife practices with a health care agency that provides medical consultation, collaborative management and referral. Clinical Nurse Midwife practices in all 50 states in the United States, Great Britain, Canada in hospitals and in birthing centres and in the home, but it has not yet started in India.

[**CERTIFIED REGISTERED NURSE ANESTHETIST**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#18) **(C.R.N.A):**

C.R.N.A. is a registered nurse who has advanced educational preparation, including classroom and Laboratory instruction and supervised clinical practice in the delivery of anaesthesia to client in a variety of practice settings, including hospitals, ambulatory surgical centers, birthing centers and clinics. C.R.N.A. takes care of patient’s anaesthesia needs before, during and after surgery.

The role includes:-

* Performing physical assessment
* Participating in pre-operative teaching
* Preparing for anaesthetic management
* [Maintaining anesthesia](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#19)intra operatively
* Overseeing recovery from anesthesia
* Following the patient’s post-operative course from recovery room to patient care unit.

**OTHER AREAS FOR PRACTICE IN SERVICE MOBILE NURSING:**

**1. Mobile nursing**:

It is a service agency that provides home teaching and care for patients with varied needs and health problems.

[**Beneficiaries of Mobile**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#20)**Nursing:**

* Patients discharged early from hospitals.
* Patients suffering from chronic and acute medical problems.
* Surgical patients.
* Patients requiring I.V. therapy.
* The elderly Respiratory patients.
* The seriously ill.
* Patients in need of medication management
* Hospice concept
* Ventilator dependent
* Assistance with bathing, dressing, meals, transportation, light housekeeping.

**2. SPACE NURSING:**

* Nursing Society (SNS) Founded in 1991, over 400 members from around the world.
* Space Nursing provides a forum for the discussion and exploration of issues related to nursing in space and its impact upon the understanding of earth-bound nursing through conference participation.
* Cardiac monitors originated with space program.
* Ultrasound studies assessing bone loss in astronauts abroad the space station could help nurse’s better care for patients with osteoporosis.

[**Functions of Space**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#22)**Nursing:**

* Evaluate emergency plans.
* Use of medications in space.
* Telemedicine opportunities.
* Performing surgery in space.
* Developing a condition database to evaluate the risk of certain accidents or illness during a flight.

**3.FORENSIC NURSING:**

Nurse should be Specialized training in forensic evidence collection, criminal procedures, legal testimony expertise. Liaison between the medical profession and that of the criminal justice system. Came about in 1992 during the first ever national convention of sexual assault nurses.

**4.ARROW NURSING:**

Services provided by arrow nursing are:

* Administration and stoppage of blood services.
* Clinical laboratory services.
* Activities services
* Dental services
* Housekeeping services
* Mental health services
* Nursing services
* Occupational therapy services Pharmacy services

**5.**[**PHYSICAL THERAPY:**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#25)

* + Physician services
	+ Social work services
	+ Speech/ language pathology services
	+ Diagnostic X-ray services

**6. DISASTER NURSING:**

Readiness and preparedness in responding to immediate community needs during and after a catastrophic event. Medical history and physical assessment, psychosocial assessment and referral to mental health services.

**7.** [**HOSPICE NURSING:**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#26)

* Observing, assessing, and recording symptoms for terminally ill patients.
* social worker, home-care aide and physical, occupational, or speech therapist.

**8. RESEARCH:**

Research is directed towards building a body of nursing knowledge about “human responses to actual or potential health problems”. The vision for nursing in the 21st century is the development of scientific knowledge base that enables nurses to implement on evidence-based practice. Evidence Based Practice incorporates critical thinking and research utilization competencies. It stresses the use of research findings, and as appropriate, quality improvement data and affirmed experiences to support a specific

[**AIM OF RESEARCH**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#28) **IN FUTURE:**

1. To create a research culture.
2. Provide high quality educational programme to prepare a workforce of nurse scientist.
3. Develop a sound research infrastructure.
4. Obtain sufficient funding for essential research

[**EVIDENCE BASED PRACTICE**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#29)

1. Goal is to achieve cost-effective, high quality patient care based on scientific inquiry.
2. Nurses need to understand research process involved
3. Nursing care should not be based on opinions, past practices, but on the results of scientific research

[**FUTURE OF NURSING**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#30)**CAREER**

* Many nursing functions will be automated.
* Result of nursing shortages, healthcare facilities will be forced to use their nurses judiciously.
* Changes in technology will possibly attract more men and minorities into the profession.
* The number of outpatient care will increase, as will the need for Home health care nurses.
* Community health care.
* Focus more on preventing the illnesses rather than treatment.

[**CHANGING ROLES OF**](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#31)**NURSE**

* Educator
* Administrator
* Practitioner
* Researcher

**Teacher or educator role:**

Explains concepts and facts about health, demonstrates procedures, reinforces learning, determines understanding, and evaluates progress of learning ′ Unplanned or informal education ′ Planned or formal education.

**Client advocate:**

Nurse protects the clients human and legal rights. Providing information to assist in decision making Patient Bill of Rights.

**Comforter Role:**

Caring for client as a human being ′ Role is traditional to nursing ′ Care is directed to whole person, not just a body part

**Rehabilitator role:**

Assist client to return to optimal level of functioning ′ Nurse helps client to adapt physically and emotionally to changes in lifestyle, body image.

**Communicator Role :**

Role is central to all other roles ′ Involves communication with client, family, healthcare team members, resource people, and the community Without clear, concise communication it will be difficult to give effective[10,11,12].

**ROBOTIC NURSING:**

The reliance on robotic technology in surgical fields has been a reality for decades, but recent trends and developments indicate that the emergence of technology and even robotic technology in the delivery of primary healthcare is a growing phenomenon. Lifting Robot is intended to assist nurses particularly in the aged care setting to lift or move patients. The obvious benefit being that there is no need for nurses to compromise their own back-health in the process of assisting their patients. The use of a robot, as opposed to a mini-lifting machine is intended to make the process a bit less intimidating for the patient. ‘Stan the Man’ – which is used to train nurses and health professionals. The robot is designed to respond to various treatments applied by the trainee nurse.

**The emerging technologies in Nursing,**

* **Cognitive Computers:**

Cognitive computing is the use of computerized models to simulate the human thought process in complex situations where the answers might be ambiguous and uncertain. [1]

* **Augmented and Virtual Reality:**

Augmented Reality (AR) combines the digital world with real elements. It is a technology that is equally suitable for mobile devices and desktops. What makes it special is the fact that it offers the possibility of reflecting digital components in the real world.

* **Scanners at Home:**

Scanners at home aids to monitor the patients in distance places. It also reduces medical errors and guides to improve the quality of care.

* **Wearables:**

Wearable technology is designed as an object to be worn by the person himself. Since he\she’s body parameters are closely monitored. Some pf the common types of wearable technology includes smart watches, smart glasses etc.

* **Holographic:**

It is also a technology that describes an effect of a three-dimensional image of a subject or something in means of creating an

 unique photographic image without the use of a lens. This can bring an illusion-based effect among prosthetic users[1].

* **Artificial Intelligence:**

Though, there are ample number of inventions and innovations reign over the last decade, currently Artificial Intelligence partake the near future. The use of artificial intelligence (AI) is streamlining patient care delivery. AI and machine learning allow providers to collect and analyse vast amounts of health data to guide decision-making thereby improvising patient care.

 Some examples of artificial intelligence (AI) in nursing include:

 ***Clinical decision support****:* Clinical decision support tools include alerts in Electronic Health Records (EHRs). They can be used

 to predict risk factors and provide data to support the diagnosis or treatment. Guided decision can improve nursing care and prevent

 further errors.

 ***Sensor-based technology****:* Nursing has initiated leveraging remote sensor technology to improve patient care. AI can help gather

 data and facilitate patient monitoring, as well as recommend treatments based on the given data. This is especially helpful in

 managing chronic illness.

 ***Mobile technology****:* Consumer fitness apps and mobile heart monitors are part of the growing demand for mobile health care. This

 technology generates a great deal of data for providers, which AI can help interpret.

 ***Voice assistants and robotics****:* A voice assistant can remind patients to take medication or monitor their blood pressure. Robotics

 can be used to augment patient care and patients’ movements. [2]

* **3-D Printing:**

This innovation of 3D printed tools are used to make the placement of restorative treatments like (screws, plates and implants) which are more precise and resulting in better postoperative results.

* **Genomics and Biotechnology:**

Genomics, proteomics, and personalized medicines are the major aspects of **SynBio** related revolutionary products which are designed to improve the standard of living of patient’s life.

* **Nanotechnology:**

Nanotechnology and nano [drugs](https://www.sciencedirect.com/topics/medicine-and-dentistry/chemotherapeutic-agent) discoveries are so vast and wide-ranging. [Nanomedicine](https://www.sciencedirect.com/topics/medicine-and-dentistry/nanomedicine) has undergone impressive modifications, pushing the drug to a new level with significant healthcare outcomes. There is a need to study the significant capabilities of nanotechnology in healthcare. In medicine, extensive research is ongoing into best practices and methodologies, including [nephrology](https://www.sciencedirect.com/topics/medicine-and-dentistry/nephrology), cardiovascular disease therapeutic gene, and cancer therapy. There is a significant development in the traditional [treatment](https://www.sciencedirect.com/topics/medicine-and-dentistry/therapeutic-procedure), and the quality of [nanoparticles](https://www.sciencedirect.com/topics/medicine-and-dentistry/nanoparticle) and nanotechnology have improved and shown encouraging results.[20](https://www.sciencedirect.com/science/article/pii/S2414644723000337#bib0020)-[21](https://www.sciencedirect.com/science/article/pii/S2414644723000337#bib0021) Gene therapy has also taken advantage of nano drugs. Several investigations focused on the applications of viral vectors believed to be systems for medication delivery[3,4,5] .

 Nanobots targeting specific [cancer cells](https://www.sciencedirect.com/topics/medicine-and-dentistry/cancer-cell) to smart tablets send data back to researchers to ensure

 patients receive their treatment correctly. Nanotechnology offers the potential for in-vitro diagnosis by substituting existing

 procedures for more economical alternatives that are easier to utilise. Nanoparticles can operate as [molecular imaging](https://www.sciencedirect.com/topics/medicine-and-dentistry/molecular-imaging) agents

 within those devices and input cancer-related genetic alterations and tumour cell functional features[,5].

Some other futuristic trends are;

* Distant Care/Telehealth
* Surgical Robots and Androids
* Exoskeletons and Neuro-prosthetics[6].

**THE OTHER TRENDS IN NURSING EDUCATION:**

* + - * The enrolment of men as nursing students.
			* Diversification of nursing students
			* Computers in nursing education
			* University based education
			* Expanded nursing literature
			* Advanced nursing courses
			* Advanced clinical nursing education
			* Creative thinking in nursing education
			* Community health-oriented nursing education
			* Supervised training by nurse educators
			* Skillful teaching faculties
			* Proficiency scoring
			* Research in nursing education
			* Periodic revision of curriculum
			* Distance education in nursing
			* Collaboration with foreign universities
			* Privatization of nursing education
			* Integration of theory and practical in nursing education
			* Nursing theories in nursing education
			* Advanced educational technology
			* Emphasis on legal aspects in nursing
			* Introduction of Objective Structured Clinical Evaluation and Objective Structured Practical Evaluation
			* Accreditation of nursing institutions with state and central educational system eg. NAAC
			* Quality assurance in nursing education
			* Self education
			* Financial assistance from government and international agencies for research eg. UGC Grants
			* Scholarships and awards for the nursing students, staff nurses and faculties

**CLASSIFICATION OF FUTURISTIC NURSING**

Futuristic nursing can be classified in terms of nursing education, practice, research, administration, and an amalgamation of all the four components which might occur in the years to come.

**Fig 10: COMPONENTS OF FUTURISTIC NURSING**

**NURSING EDUCATION**

Nursing education has moved ahead from B.Sc, PBBSc, MSc, PhD and the post-doctoral programmes. There are numerous websites that give the number of Universities, nursing colleges and programmes in India.

**THE FUTURE OF NURSING EDUCATION:**

**1. Changing Demographics and Increasing Diversity**

Student demographics are changing. Ethnic and racial diversity of nursing schools has increased dramatically, creating a rich cultural environment for learning Students are entering schools of nursing at an older age and are bringing varying college and work experiences, as well as more sophisticated expectations for their education. Students are typically employed in full-time careers, and many are raising families, which places constraints on their educational experiences and necessitates greater flexibility in scheduling.

**2. The Technological Explosion**

The rapid growth in information technology has already had a radical impact on health care delivery and the education of nurses. Nurses of the 21st century need to be skilled in the use of computer technology. Distance learning modalities link students and faculty from different locales and expand the potential for accessible continuing professional education. Technically sophisticated pre-clinical simulation laboratories are available to stimulate critical thinking and skill acquisition in a safe and user-friendly environment. Faster and more flexible access to data and new means of observation and communication are having an impact on how nursing research is conducted.

**3. Globalization of the World's Economy and Society**

Nursing science needs to address health care issues, such as emerging and re-emerging infections, that result from globalization. Nursing education and research must become more internationally focused to disseminate information and benefit from the multicultural experience.

**4. The Era of the Educated Consumer, Alternative Therapies and Genomics, and Palliative Care**

Well-informed consumers who expects to participate in decisions affecting personal and family health care. More interested and knowledgeable about health promotion as well as disease prevention, and increased acceptance and demand for alternative and complementary health options. Increased power of the consumer in the patient-provider relationship creates a heightened demand for more sophisticated health education techniques and greater levels of participation by patients in clinical decisions.

Gene mapping will drive rapid advances in the development of new drugs and the treatment and prevention of disease resulting in unparalleled ethical questions and conflicts. Significant gap in the body of scientific knowledge and clinical education with regard to palliative and end-of-life care remains; nursing education must prepare graduates for a significant role in these areas.

 **5. Shift to Population-Based Care and the Increasing Complexity of Patient Care**

Managed care and risk-based contracting mechanisms have forced a shift from episodic care with an acute orientation to care management with a focus on population-based outcomes. The marriage of care with cost requires nursing professionals to understand practice methods that improve quality, respond to clinical complexity, and lower costs. Nurses must demonstrate management skills at both the organizational and patient care levels.

**6. The Cost of Health Care and the Challenge of Managed Care**

The cost of health care in the US has approached 15 percent of the total gross national product. Concerns about cost affect how work is organized, treatment plans for patients, and patients' perceptions of and participation in care. Managed care - provider contracts are still based on fees for service, reducing the incentives to manage care, prevent illness, and promote health. Medical homes concept evolving to address the latter. More research needed to demonstrate the value to the health care delivery system, & cost effectiveness of health education, health promotion, and advanced nursing practice. Nursing education programs must prepare students at all levels for roles in case management and employment in the managed care & medical home environment.

 **7. Impact of Health Policy and Regulation**

Major trends - First, an increase in state and federal regulation as costs rise and managed care expands. There will be attempts to shift to less expensive settings and apply market forces to restrain costs. Nursing schools, scholars, executives, and professional nursing organizations will need to more actively contribute to the development of health policy and regulation. Students must be prepared for a meaningful role in the political and ethical arena[3,9].

 **8. The Growing Need for Interdisciplinary Education for Collaborative Practice**

The health care delivery system of the future will rely on teams of nurses, nurse practitioners, physicians, dentists, social workers, pharmacists, and other providers to work together. Team-based, interdisciplinary approaches have been shown to be highly effective for improving clinical outcomes and reducing cost. Nurses must demonstrate leadership and competence in interdisciplinary and collaborative practice for continuous quality improvement. Teaching methods that incorporate opportunities for interdisciplinary education and collaborative practice will be required to prepare nurses for their unique professional role and to understand the role of other disciplines in the care of patients.

A significant nursing shortage continues to exist today, particularly in acute and long-term care settings. Nurse managers and executives require clinical experience, strong communication skills, business acumen, knowledge of financial and personnel management, organizational theory, and negotiation. Imperative to retain nurses in active practice over longer careers, and the desire by practicing nurses to move up the economic ladder lead to the demand for continuing education and career mobility and development9. The Current Nursing Shortage & Opportunities for Lifelong Learning and Workforce Development

**10. Significant Advances in Nursing Science and Research**

Nursing research is an integral part of the scientific enterprise of improving the nation's health. Schools of nursing must focus on the scholarship and science of nursing as top priorities. Although graduate degrees in nursing have become more common, doctorally prepared nursing professionals are not being produced in large enough numbers to meet the growing need. There is a need for enhanced mentorship for new researchers to strengthen skills and capacity to conduct meaningful nursing research.

**Implications for Educators**

At the dawn of the 21st century and the long-awaited new millennium, nurse educators face a rapidly changing health care landscape, shifting student and patient demographics, an explosion of technology, and the globalization of health care. As we position our professionals to meet today's challenges and tomorrow's, we must understand the drivers affecting nursing. To quote Peter Drucker in Managing for the Future…"It is not necessary to be clairvoyant to know the future; it is only necessary to clearly interpret what has already happened and then project forward the likely consequences of those happenings." (Truman Talley Books, 1992)

**NURSING SERVICE**

It has provided leadership opportunities and these have to be channelized appropriately to get the things done for the benefit of the patient and provide quality health care which means affordable by the patient with the advent of specialist. Nurses as pain control nurse, infection control nurse, skin care nurse and diabetic educator nurse have a wide range of expanded roles. This also involves proper use the nurses time in providing health care services rather than being caught up in the web of looking into only the environmental factors of the agency.

**NURSING ADMINISTRATION**

It involves making policies and promoting the betterment of health care by being amember of the committee within the organization and also interacting with other organizations to bring out positive changes. Proper job description and job satisfaction will make the work of a nurse easier and for other health care professionals to know what to expect from the nurse.

**NURSING RESEARCH**

Nursing research with its small beginning now has moved a long way in which nursing research is being done as a small project in the BSc nursing and a lot of individualized research activity is being carried out at the master level. Institutional researcher and collaborative research have also been started on a small scale but the findings of the research have to be disseminated and put into practice with the permission of the organization [10,11,12].

**CHALLENGES OF FUTURE NURSING**

* Placement in terms of education or experience both to be given in their due importance.
* Overcoming the concept of “A Nurse is a nurse” –who identifies the resources and approximately demonstrating competencies.
* Uniformity of entrance into education and service area to overcome discrepancies.
* Placement, position and promotion are based on the capacity, education and skills and efficiency.
* Research dissemination and application are with due importance to the findings rather than to the methodology.
* Joint research, sponsorship, institutional research will be with co-operational among the members.
* Increase in Indian authors and publications of nursing literature should be encouraged.
* There are numerous challenges facing nursing from both within and outside and as a member of this group. It becomes nurse’s duty to take up the relay in launching nursing further ahead with the right fuel of efficiency, co-operation, evidence-based practice in order to meet the changing needs of the society, health care, private and public players, economy and the government[10].

**NURSING’S CHANGING HEALTH CARE ROLE**

1. As nursing’s transition from an illness-care orientation to health promotion and health maintenance increases, and as future health needs begin to surface, new perceptive are need.
2. A changing health care role requires that nursing meet its societal responsibilities by orienting nurses to their evolving health care role.
3. As identified in the definition of nursing addressed in the ANA’S societal policy statement of human resources to actual or potential health problems.
4. Once nurse accept this social mission, they should be able to articulate what contributions nursing makes to the health care of individual’s, regardless of their health state.
5. To assume responsibility for assessing the health status of people within society will require a greater nursing knowledge and more skillful nursing practice than previously processed by practicing nurse.
6. The challenge to nurses will be to translate nursing’s specific knowledge base into innovative ways to provide nursing care in promoting and maintaining health.
7. Specialization in nursing will undergo many changes, as new speciality areas are developed from nursing diagnostic classifications, such as anxiety, pain, oncological, burn chronicity, cardiovascular and respiratory categories.
8. The increases of chronic illness and an aging population will lead to greater involvement of future professional nurses in long-term care of the elderly in various stages of health.
9. Nurses will care for clients in their homes, ambulatory health clinics, nursing homes, hospitals, day care, wellness centres and other extended care facilities[11].

**IMPACT OF NURSING RESEARCH ON FUTURE NURSING PRACTICE**

Nursing research is essential to produce a specific theoretical knowledge base that professional nurses can use to provide quality nursing care for individuals with critical or chronic illness or for people seeking health promotion and health Maintenance Services. Over the next two decades, nursing research will increase their efforts to apply research will increase their efforts to apply research findings to nursing practice. As nurse researchers and nurse clinicians interact and collaborate with one another, research findings will be utilized and nursing practice will be greatly improved.

**EFFECTS OF COMPUTERIZED TECHONOLOGY ON NURSING’S FUTURE**

Computer terminals located in nursing units in hospitals are revolutionizing nursing functions and reducing the time needed to order medications and supplies from pharmacy, to transcribe and implement medical regimens, and as mentioned previously, to develop and use computerized care plans.

 Computer located in patient units in hospitals are providing easy access for caregivers in decision-making and in acquiring more effective communication. Computer networking for nurse administrators can save time, with interoffice memoranda computerized and transmitted to other officers within hospitals oor university campuses and transmitted to other offices, thus providing thecapability for receiving feedback in far less time than in previous systems.

**EDUCATION OF FUTURE PRACTITIONERS FOR A CHANGING HEALTH CARE SYSTEM**

Nurse educators are responsible for preparing tomorrow’s nurses for professional nursing practice and must prepare them for a future that can only be vaguely envisioned in this present decade. Professional nurses are assuming more complex responsibilities for health care delivery system than ever before. The burden on nurse educators to predict health care needs and to prepare nurses for a world of nursing broadly different from that of the present period challenges, for them they might be risk takers and leaders if they are to move nursing forward with vision and confidence [12].

**Bibliography:**

1. Alexander S.Gillis, a guide to artificial intelligence in the enterprises https://www.techtarget.com/searchenterpriseai/definition/cognitive-computing
2. Alexandria.S. Future trends in nursing, [https://online.regiscollege.edu/blog/future-trends-in- nursing/](https://online.regiscollege.edu/blog/future-trends-in-%20nursing/).
3. Quader, X. Liu, K. Toh, *et al.* Supramolecular enabled pH-triggered drug action at tumor microenvironment potentiates nanomedicine efficacy against
4. glioblastoma, Biomaterials, 267 (2021), Article 120463
5. M. Azimzadeh, M. Rahaie, N. Nasirizadeh, M. Daneshpour, H. Naderi-Manesh, Electrochemical miRNA biosensors: the benefits of nanotechnology Nanomed Res J, 1 (3) (2017), pp. 158-171.
6. Bayford, T. Rademacher, I. Roitt, S.X. Wang, Emerging applications of nanotechnology for diagnosis and therapy of disease: a review Physiol Meas, 38 (8) (2017), p. R183
7. Zaheer-Ud-Din Babar and Anna Birna Almarsdottir, Future of Pharmacy Practice Research (2011)
8. [Shebeer. P.](https://www.slideshare.net/MonikaSyal/futuristic-nursing-171117973?from_action=save#38) Basheer. S.Yasmeen Khan Advanced Nursing Practice 2nd Edition 2017. Page No. 59 To 63.
9. Navdeep Kour Brar. H C Rawat Advanced Nursing Practice 1st Edition Page No. 945,984,961,1010,1026.
10. Marla T. Oros, R. Heller and Jane Durney-Crowley **The Future of Nursing Education: Ten Trends to Watch (2021), page no:18,19,20**
11. Seetha Lakshmi, Futuristic nursing, Nightingale nursing times, volume-5, may 2009, pp no 17-18.
12. Margaret M. Moloney, professionlization of nursing, published by J.B.Lippincott company pp no 309-320
13. <https://www.researchgate.net/publication/283473272>
14. https://www.researchgate.net/publication/49782798