

## **HOLISTIC EDUCATION IN PHARMACY: A BASIC REQUIREMENT IN SCULPTING BENEVOLENT PHARMACISTS FOR A QUALITY HEALTHCARE SYSTEM**

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### **Abstract**

Holistic education is an approach to teach and educate students based on the social, ethical, and academic needs of the society in an integrated learning format. This ideology gives importance to create an optimistic educational environment and moral support to the students. It inculcates academic, curricular and social conscience in students which will be reform them into a responsible health care professional. A holistic curriculum in pharmacy looks into the disparate learning skills and backgrounds of students. They are taught principles that reflect on their actions which will impact on global community. Academicians in pharmacy engage students with projects that apply critical thinking to educate them in solving real problems. Holistic pharmacy education is essential for transforming healthcare by prioritizing a patient-centered and all-encompassing approach to treatment. This educational model extends beyond the conventional emphasis on medications and disease management, incorporating the physical, emotional, mental, and social dimensions of health. As time's change, there arises a need to refine existing education system. The advancements in technology have influenced the students due their constant exposure to digital world. This exposure has led them to either become more innovative or less dedicated to the curriculum subjects and their value. A perfect balance to manage technological advancements and course related subjects is possible only with a holistic education system. Holistic education encourages students to think appropriately and indulge in activities in reforming themselves in to a benevolent pharmacist.

## **Introduction**

A holistic education is an approach to teach and educate students based on the social, ethical, and academic needs of the society in an integrated learning format. This ideology gives importance to create a optimistic educational environment and moral support to the students. It inculcates academic, curricular and social conscience in students which will be reform them into a responsible health care professional. in A holistic curriculum in pharmacy looks into the disparate learning skills and backgrounds of students. They are taught to reflect on their actions and how they will impact and learn from the global community. Teachers engage students with projects that apply critical thinking to solving real problems.

## **Need for holistic education in pharmacy**

As times change, there arises a need to refine existing education system. The advancements in technology have influenced the students due their constant exposure to digital world. This exposure has led them to either become more innovative or less dedicated to the curriculum subjects and their value. A perfect balance to manage technological advancements and course related subjects is possible only with a holistic education system.<sup>1</sup> Holistic education encourages students to think appropriately and indulge in activities in reforming themselves in to responsible pharmacists.

## **Transformation of pharmacy system:**

Analogous to other healthcare profession, the advent of pharmacy can be inked back to 2000 years. Primeval pharmaceutical text ever discovered dates to the Mesopotamians in 2100 B.C.<sup>1</sup>In Recent times, there is a rise in the patient care and non-dispensing activities. a pharmacist spends quality time in Immunizations and patient counselling. A focus on partnering with medical professions helps in empowering the pharmacy practice to flourish and expand its patient care role.<sup>2</sup>

In the past, there were four branches of traditional medicine in the world: Chinese, Egyptian, Indian, and Roman. Among them, only traditional Chinese medicine has lasted for thousands of years and is widely accepted and still practiced in the world up to today. The other three branches, today, are found only as records in historical documents and have been annihilated with the disappearance of these ancient civilizations.

Chemical compounds can regulate the functions of the body in alleviating, preventing, and diagnosing diseases, which are also referred to, in general, as chemical drugs. The theoretical system of studying chemical drugs is called chemical pharmacy. In past centuries, achievements in chemical drug research have been attributed mainly to the development of chemotherapeutics, pharmacology, and clinical medicine.

The rise of biopharmacy is supported by the emerging field of molecular biology, especially research into genome science, which promotes the development of modern pharmacy. Biotechnology drugs, monoclonal antibodies, and gene therapy technology have greatly enriched therapeutic strategies. The combination of genome science and modern

bioinformatics has revealed the molecular mechanism of many stubborn diseases, making it possible to choose proper drug targets and design rational new drugs, which have become new therapeutic methods.<sup>3</sup>

## **Holistic pharmacy education: constructive methods**

### **1. Multidisciplinary educational plan:**

A syllabus that covers a diverse range of topics, blending core pharmaceutical subjects with modules on humanities, self-awareness, ethical responsibility in the field, communication skills, and health informatics. This will nurture the students to gain collective knowledge and necessary skills for holistic vigilance.<sup>4</sup>

### **2. Experimental learning:**

Experiential learning is a learning approach that focuses on educating students with live experiments, creative workshops, and regular skill based training as a tool for learning. Its well-known fact that intelligence and cognition is achieved mainly through experience derived by real-world trouble shooting skills, hands-on activities, , and interconnecting theoretical concepts with practical aspects. Important aspects of experimental learning include:

- Factual acquaintance: Students should be made to engage themselves in activities that are factual and appropriate.
- Abstract conceptualization: it is the knowledge gaining by watching others or developing observations about one's own experience and creating theories to explain observations.
- Active experimentation: Students should be educated to employ their new learning in varied circumstances, execute and fine tune their comprehending skills.

Examples of experimental learning include, Internships and Apprenticeships, Service Learning, Project-Based Learning, Simulations and Role-Playing, Field Trips and Study Abroad.

### **3. Social-Emotional Learning:**

- Emotional Literacy: Students should be educated to recognize, understand, and manage their emotions in different situation and stay poised.
- Relationship Skills: A guidance regarding communication, cooperation, and dispute settlement has to nurture among students as personality development trait.
- Concentrated attention: Also known as mindfulness is an important practice to be developed in students which involves meditation and thoughtful thinking to develop coherence in understanding everything that is taught.

### **4. Personalized Learning:**

- Personalized learning is an approach in education that targets to tailored learning based on individual student's potential, requirements, talents, and sense of curiosity. Every student gets should be provided with a learning plan which is based on knowledge level and their learning capacity.
- Individualized Learning Plans: Tailor education to meet the unique needs, strengths, and interests of each student.

- Student Choice: A freedom of speech to have a say in what and how they learn, giving them ownership of their educational journey.

#### **5. Character Education:**

- Educational ethnics: Students should be educated regarding the important values of life such as responsibility, honesty, respect and empathy.
- Personification: The academic professionals can inculcate specific character in students by personifying famous people who were appreciated for their unique character considering as role models.

#### **6. Arts and Creative talent Expression:**

- Co-curricular activities: A regular activities on art, music, literary activities and event organizing should be promoted among students to bring cultural indulgence.
- Self-Expression: Students should be given opportunities to express themselves by one of these ways such as paragraph writing, narrating stories, and other creative ways.

#### **7. Wellness and Physical Education:**

- Physical Education: Regular physical exercise should be stressed and be made mandatory to encourage healthy lifestyles.
- Inculcating nutritional awareness: Knowledge on healthy eating habits should be promoted among the students to know the importance of nutrition.

#### **8. Cultural Proficiency and multicultural literacy:**

- Disparate Perspectives: The curriculum should focus on cultural perspectives in the curriculum to widen students' perception of the world.
- Existing Global problem: Indulge students in discussion concerning global issues like ecological balance, social wellness, and civil rights to create responsibility as a healthcare professional.

#### **9. Community and Family Involvement:**

- Active participation of Parents: Parents must be involved in the educational plan through regular correspondence, programs, and given opportunities to volunteer in activities.
- Community coalition: The education organization should join forces with with local organizations and business firms to enhance the educational familiarity.

#### **10. Introspective Practices:**

- Journal writing: students must be encouraged to write dairy where the shall make note of daily activities which helps to mirror their learning experiences and personal experience.
- Conversation and Dialogue: The organization should conduct open discussion and dialogues on different subjects to imbibe constructive thinking and retrospective analysis.

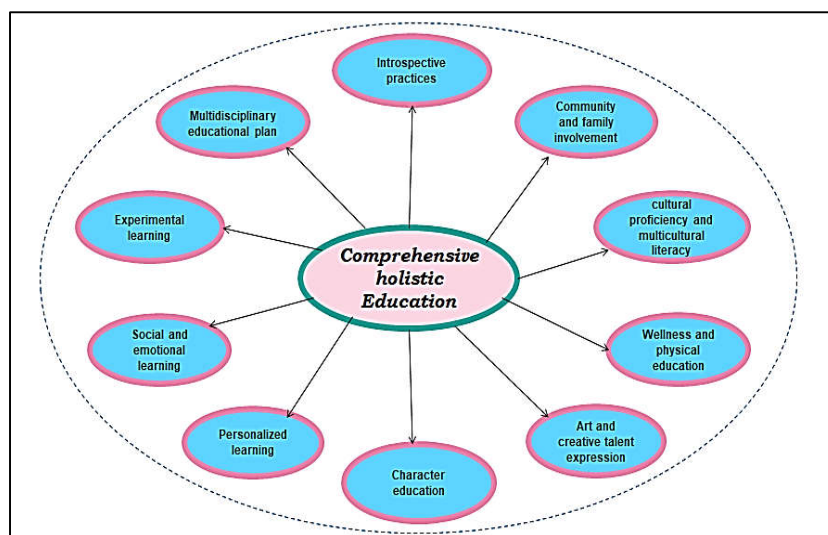


Figure 1: Holistic Pharmacy Education: Constructive Methods

### Strategies for implementing holistic education

To effectively implement holistic education in pharmacy Institution, the educators should:

1. **Construction of a Supportive Environment:** The institution should work towards nurturing and comprehensive college culture that relies totally on the holistic development of each and every student.
2. **Professional Development:** The educators should be constantly exposed to the ongoing professional development in order to equip themselves with the skills and knowledge needed for holistic teaching.
3. **Collaborative education:** Propagating collaborative education among the students creates environments where they learn from and with each other.
4. **Evaluation beyond Academics:** The educators should utilize evaluation strategies that compute not only academic calibre but also accounts for social-emotional development, grading creativity, and other holistic responses.
5. **Promoting empathy and self-efficacy:** Fostering empathy and self-efficacy in pharmacy students through service learning will promote the ability of pharmacy students to excel in direct patient interactions which is a crucial aspect of the health care system

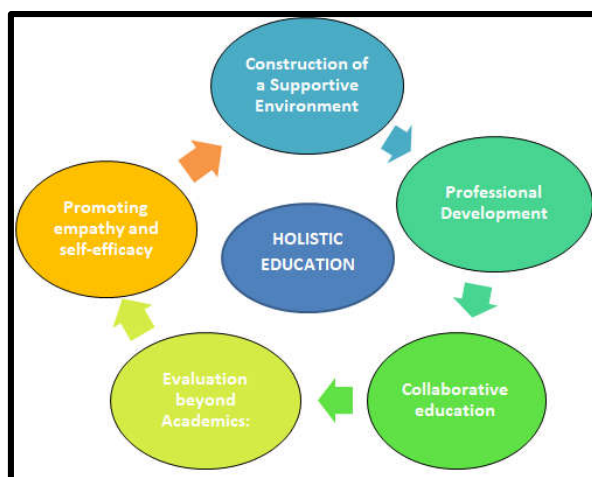


Figure 2: Strategies for implementing holistic education

Holistic education is about nurturing the complete individual, preparing students not just for academic success but for life. By integrating these strategies into the educational process, educators can help students develop into well-rounded, thoughtful, and capable individuals who are ready to contribute positively to society.<sup>5</sup>

Every education institution must develop clear strategies, assemble teams, engage with all stakeholders (and consult external experts if necessary), and execute these plans with precision. Key elements for success include teamwork, striving for excellence, regular review, and clarity of objectives, process improvement, and result measurement, benchmarking against peer and leading institutions, consistency, alignment, and making decisions based on facts. Assessment, planning, and improvement should be treated as interconnected activities.

India's National Education Policy (NEP), launched in 2020, represents a major transformation of the nation's education system, the first significant reform since 1986. It emerged from the understanding that the education system needed to be modernized to meet the challenges of the 21st century, aligning with global standards while addressing the unique needs of a diverse and rapidly evolving society.

Formulated after extensive consultations, NEP 2020 seeks to make education more holistic, flexible, and multidisciplinary, designed to meet the demands of the knowledge economy. It recognizes the crucial role education plays in empowering individuals and driving national development.

### **The vision of NEP 2020:**

An education system rooted in Indian ethos that contributes directly to transforming India, sustainably into an equitable and vibrant knowledge society, by providing high-quality education to all, and thereby making India a global knowledge superpower.

The curriculum and pedagogy of our institutions must develop a deep sense of respect towards the fundamental duties and Constitutional values, bonding with one's country, and a conscious awareness of one's roles and responsibilities in a changing world.

### **Adopting a Holistic Approach to Education in rapidly evolving world**

Holistic education is a comprehensive approach to teaching where educators seek to address the emotional, social, ethical, and academic needs of students in an integrated learning format.

In our rapidly evolving world, traditional educational institutions often emphasize academic achievement while overlooking the comprehensive development of students. Recognizing this, educators and policymakers are increasingly advocating for a holistic approach to education, one that nurtures well-rounded, responsible, and mature individuals.

As we progress into the 21st century, the education system has seen a substantial shift. This transition toward holistic education has been shaped by several key factors, such as:

**Global Trends:** There is increasing international acknowledgment of the need for holistic education to prepare students for the demands of the 21st century. India has also recognized that embracing this approach is crucial for the nation to succeed and thrive on the global stage.

**Changing Parental Expectations:** Parents' priorities have evolved beyond focusing solely on their children's exam results. Today, they understand that education is more than just scoring high grades. They see the importance of supporting their child's overall development and the cultivation of essential life skills, which influences their school selection.

**Educational Research:** A wealth of research has demonstrated that academic success alone does not guarantee future achievement. Students must comprehend key ideas, whether drawn from textbooks or life experiences. Moreover, a holistic education approach is proven to enhance students' well-being.

**Government Initiatives:** Over the years, the government has implemented various policies that highlight the significance of a holistic educational approach. These initiatives focus on learner-centered teaching methods, with key examples including the National Curriculum Framework (NCF) and the National Education Policy (NEP).

**Incorporates Mental Well-Being:** Mental health has emerged as a major concern in society. According to a study by the centres for Disease Control and Prevention (CDC), approximately 1 in 5 children in the United States have a diagnosable mental, emotional, or behavioural disorder. Holistic education weaves mental well-being into the school curriculum, offering support to students and fostering stress-free learning environments.

**Fosters Physical Health:** Physical well-being is often overlooked as modern life requires minimal physical activity. This has led to a rise in childhood obesity, with nearly 19% of children and teenagers in the U.S. being obese. Holistic education emphasizes physical education, sports, and health, promoting the importance of physical activity, proper nutrition, and overall wellness.

**Prepares Students for Future Employment:** Success goes beyond academic achievement, and holistic education helps meet this need. It equips students with the skills and knowledge essential for overcoming life's challenges. By fostering abilities like critical thinking,

creativity, problem-solving, and teamwork, holistic learning prepares students for the evolving demands of the future workforce.

**Nurtures a Sense of Global Responsibility:** Holistic education encourages an understanding of diversity, equity, and inclusion, shaping students into responsible global citizens. In an increasingly interconnected world, having global awareness and cultural competence is crucial. By instilling these values, holistic education empowers students to become conscientious citizens of the future.

Holistic education focuses on the complete development of students. This approach encompasses various skills, behavioural training, physical fitness, and other elements essential for students to thrive as integrated members of society.

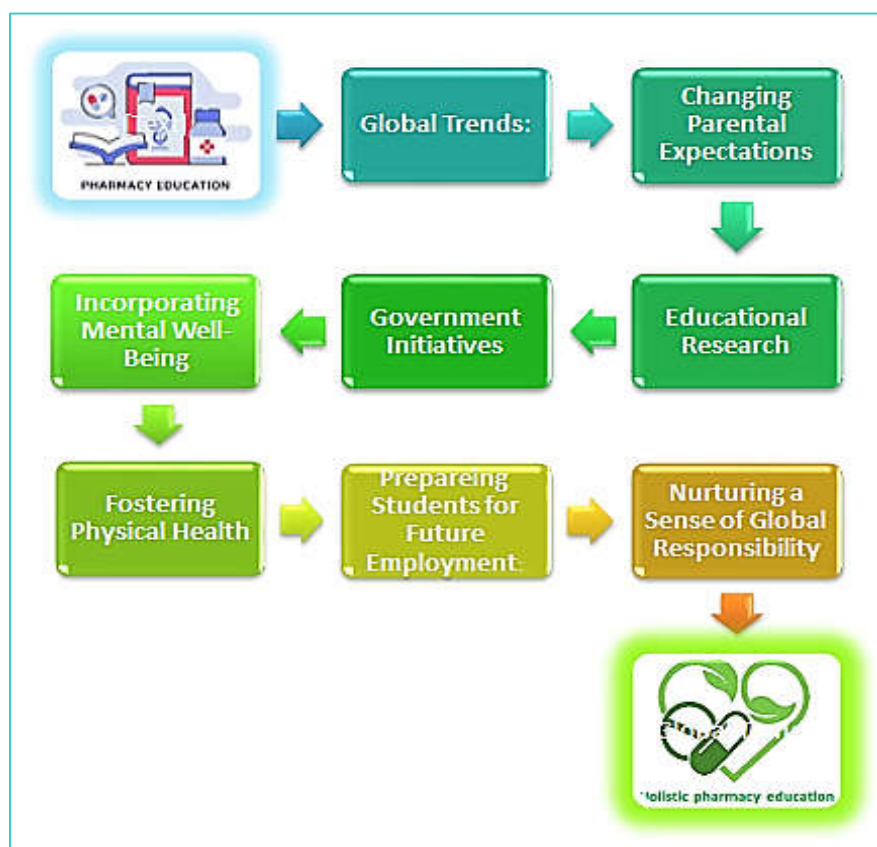


Figure3: Transforming pharmacy education to embrace a holistic approach

Importantly, holistic teaching methods do not disregard theoretical education; instead, they incorporate all dimensions of human development, including theoretical knowledge in various subjects. Schools that implement holistic teaching strategies are often viewed as progressive and tend to attract more students and parents. The aim of holistic education is to nurture all facets of a student’s life without sacrificing the quality of theoretical learning. Through this approach, students can cultivate the talents and skills necessary to navigate society effectively. Lacking these skills, students may struggle to integrate into the existing social framework<sup>6</sup>



## **Empathy based pharmacy education**

Empathy, a fundamental human trait important in all areas of life, is crucial in health care. There is a well-documented link between health care providers' empathy and improved patient adherence, satisfaction, and treatment outcomes. Empathetic students demonstrate stronger emotional skills and are better equipped to develop, strengthen, and exhibit affective behaviors, abilities, and attitudes.

While empathy is an innate quality, it is adaptable. Educational interventions throughout the curriculum, including both classroom and hands-on training, can influence empathy levels. The effectiveness of teaching methods can be enhanced by activities that foster empathy and help students build essential affective skills. Teaching, modeling, and assessing empathy and the related emotional competencies necessary for patient-centered care should be a regular and intentional part of health care education

Pharmacy schools and other health care programs carry the vital responsibility of educating and shaping competent, value-driven health care professionals who possess strong empathy and affective skills, which are critical for effective patient-centered and team-based care

## **Holistic integrative pharmacy**

Holistic Integrative Pharmacy is a modern pharmacy system that brings together knowledge, theory, and practices from various related fields, adapting them to real-world needs, making it better suited for human health care. The term "holistic" refers to the combination of different elements, such as the requirements, standards, and outcomes of education. "Integration" denotes the reorganization process, representing the method, tools, and procedures of education. This approach aligns with historical and philosophical foundations of pharmacy and reflects its developmental trends. Holistic Integrative Pharmacy focuses on merging advanced theoretical knowledge and practical experience in a systematic and scientific way to create a cumulative impact.

Holistic integrative pharmacy operates as an open system, which implies that it should include all new knowledge that can contribute to its advancement. At its core, it unifies the entire spectrum of pharmacy knowledge and resources. This method brings together modern and traditional pharmacy, pharmacy with medicine, and pharmacy with contemporary information technology. It also bridges basic research with applied development in pharmacy, while incorporating aspects of the humanities.

## **Educational schema for holistic integrative pharmacy**

The curriculum design for Holistic Integrative Pharmacy aims to create a well-rounded program that combines multiple facets of pharmacy education. It integrates traditional and contemporary pharmacy knowledge with related fields, such as medicine and technology, while balancing both theoretical learning and hands-on experience. The curriculum is adaptable to the changing needs of healthcare, promoting interdisciplinary collaboration,

advanced research, and practical skills development to prepare students for a holistic approach to pharmacy practice.<sup>7</sup>

The curriculum design for Holistic Integrative Pharmacy relies on an education model which shall function based on:

- Fostering innovative thought processes
- Developing professional expertise through innovation-focused learning
- Coaching on experimental techniques with a focus on integrated ideas

### **Proficiency-oriented pharmacy education**

To align with the expectations of healthcare professionals, pharmacy education must cultivate the knowledge and skills essential for professional practice and societal service. Given that pharmacists hold significant roles within the healthcare system, there is a critical need for high-quality, competence-based pharmacy education. The pharmacy profession must acknowledge and adjust to market-driven changes that are also impacting other health sectors today. Pharmacy education should be guided by strategically developed curricula that deliver educational outcomes aligned with the evolving needs of the workforce and enable adaptability to advancements in the field.

To modernize the national undergraduate pharmacy education and training program, higher education institutions (HEIs) require a thorough and transparent understanding of both current and future objectives. This clarity is essential to enhance the strategic planning and decision-making process for curriculum development. The Master's degree program is designed to equip future pharmacists for diverse career opportunities within the profession; however, the duration of the training and the total number of contact hours are constrained. Over the past decades, despite the profession's diversity, pharmaceutical practice has progressively shifted from a focus on medication and distribution to a patient- and therapy-centered approach, in line with the global movement toward more personalized and patient-focused healthcare

The evolving landscape of pharmacy is witnessing an increasing acknowledgment of enhanced cognitive pharmaceutical services, alongside the conventional roles and responsibilities of pharmacists, which include compounding, patient service, and quality assurance. Pharmacists are now being recognized for a broader range of advanced competencies that extend well beyond the traditional tasks of dispensing and compounding.<sup>8,9</sup>

### **Holistic pharmacy education and flawless healthcare system**

Pharmacy education plays a crucial role in ensuring a steady supply of pharmacists to address the demands of the social and healthcare sectors. At the same time, the current cohort of pharmacy undergraduates will form the next generation of professionals in this field. They will have a significant impact on influencing or even shaping the future development of the

pharmacy profession. In light of this, it is crucial to comprehend pharmacy students' perceptions and expectations regarding their studies.

Addressing the inadequate motivation among pharmacy students and the low societal standing of pharmacists is essential for improving pharmacy education in developing countries. These factors significantly influence both the direction of pharmacy education and the professional recognition of pharmacists.<sup>10</sup>

Pharmacists play an essential role in the healthcare system of the country, leveraging their extensive expertise in medication composition, formulation, and application. The caliber of pharmacy education significantly influences the overall quality of healthcare provided to the population in any nation. In India, there are around 1.7 million registered pharmacists, all of whom rely on the education they obtain to achieve their personal and professional aspirations, while also shaping the future of comprehensive patient care in the country.

Pharmacy education in India is often perceived through an industrial and product-centric lens, which restricts the potential for growth in both the profession and its educational methodologies. The existing curriculum is intricate, follows a conventional framework, and does not effectively incorporate collaboration with other healthcare disciplines. Additionally, it tends to be slow in embracing contemporary developments. Considering that healthcare requirements can vary due to factors like geography, culture, age, and gender, it is essential for pharmacy education to focus on meeting these varied needs instead of concentrating solely on industry or production aspects<sup>11</sup>.

### **Innovative concepts transforming pharmacy education**

#### **➤ Online learning platforms and virtual simulations:**

Digital learning platforms and virtual simulations are increasingly enhancing, and in some cases, substituting traditional classroom environments. These technologies provide an engaging and interactive educational experience, enabling students to practice real-world situations within a safe framework. Activities such as virtual patient interactions, medication dispensing exercises, and dynamic case studies foster a more practical and captivating learning atmosphere. Furthermore, online platforms support asynchronous learning, catering to the varied requirements of students. This advancement not only expands educational access but also encourages self-directed learning, which is vital in a field that demands ongoing education.

#### **➤ Telepharmacy and Distance Learning Opportunities:**

The growth of telehealth services also affects pharmacy education. Telepharmacy, which entails the remote delivery of pharmaceutical care, is increasingly integrated into pharmacy curricula. Students can gain hands-on experience through telepharmacy rotations, where they learn to manage medication therapy and provide counselling from a distance. This advancement aligns with the evolving methods of healthcare delivery and introduces students

to the challenges and opportunities within digital healthcare. Mastering the use of technology to deliver patient-centered care is a crucial skill for aspiring pharmacists.

In the constantly changing healthcare landscape, telepharmacy stands out as an innovative approach, transforming how pharmacy education is conducted and experienced. This method not only adapts to the shifting dynamics of healthcare services but also enhances the educational journey for future pharmacists by incorporating remote experiential learning. Telepharmacy involves delivering pharmaceutical care and services through technology, allowing pharmacists to connect with patients.

This novel approach helps tackle issues related to access to healthcare services, especially in underserved or remote areas where physical pharmacies may be scarce. In pharmacy education, telepharmacy provides students with the chance to engage in medication therapy management and counseling. Through virtual interactions, students learn to conduct patient consultations, address medication-related concerns, and contribute to improving health outcomes, all within a digital framework.

➤ **Incorporation of inter professional education:**

Healthcare is fundamentally collaborative, requiring professionals from various fields to work together effectively. Acknowledging this, pharmacy education is integrating interprofessional education (IPE) into its curriculum. Students collaborate with peers from other healthcare fields, including medicine, nursing, and public health, to address complex healthcare challenges. IPE encourages a team-oriented approach to patient care and fosters a comprehensive understanding of healthcare systems. Through IPE, future pharmacists develop essential communication, collaboration, and problem-solving skills, equipping them for a cooperative healthcare setting. In IPE, pharmacy students participate in shared learning experiences with colleagues from diverse healthcare disciplines, such as medicine, nursing, and public health. This interdisciplinary method promotes a well-rounded understanding of healthcare systems, dismantling professional silos and fostering effective communication and teamwork.

➤ **Impact of pharmacogenomics on pharmacy education:**

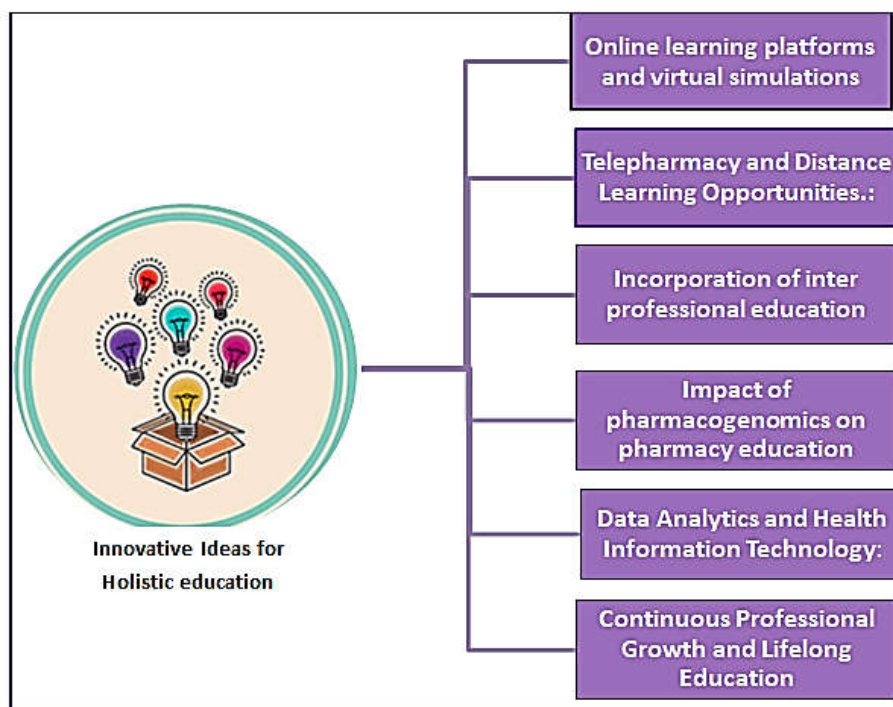
Progress in pharmacogenomics is reshaping pharmacists' comprehension and application of drug therapies. Pharmacy education is integrating genomics into its programs, ensuring that students grasp the significance of genetics in drug response. This approach to personalized medicine allows pharmacists to customize treatments according to a patient's genetic profile, enhancing therapeutic results and reducing the risk of adverse effects. Training pharmacists in pharmacogenomics empowers them to make well-informed choices regarding drug selection and dosing, ultimately leading to more accurate and effective patient care.

➤ **Data Analytics and Health Information Technology:**

The growing digitization of the healthcare sector is producing significant volumes of data. In response, pharmacy education is evolving by incorporating data analytics and health informatics into its programs. Students are trained to interpret and analyze health-related data, which provides valuable insights for medication management, patient outcomes, and healthcare policy development. Proficiency in navigating electronic health records (EHRs) and utilizing data analytics tools equips pharmacists to make informed, evidence-based decisions, enhance healthcare quality improvement efforts, and engage actively in the changing realm of healthcare technology.

➤ **Continuous Professional Growth and Lifelong Education:**

The fast-changing landscape of pharmacy necessitates that professionals commit to lifelong learning. As a result, pharmacy education is placing greater emphasis on continuous professional development (CPD). Students are encouraged to adopt a lifelong learning mindset, keeping up with emerging trends, new medications, and changing healthcare policies. This approach ensures that pharmacists stay up-to-date and proficient throughout their careers, ultimately enhancing patient care and facilitating professional advancement<sup>12</sup>.



**Conclusion**

Holistic pharmacy education is essential for transforming healthcare by prioritizing a patient-centered and all-encompassing approach to treatment. This educational model extends beyond the conventional emphasis on medications and disease management, incorporating the physical, emotional, mental, and social dimensions of health. It fosters the development of pharmacists who can enhance patient outcomes and promote overall well-being. In the context of evolving healthcare systems that increasingly demand personalized, preventive,

and patient-focused care, holistic pharmacy education is vital. As the healthcare landscape shifts towards value-based care, pharmacists equipped with a comprehensive understanding of health are better prepared to make significant contributions, ensuring that patients receive not only effective treatments but also empathetic and comprehensive care.

Holistic pharmacy education plays a crucial role in transforming healthcare by emphasizing a patient-centered, comprehensive approach to treatment. It goes beyond the traditional focus on medications and disease management by integrating the physical, emotional, mental, and social aspects of health. This mode of education cultivates pharmacists who can contribute to improved patient outcomes and overall well-being. Holistic pharmacy education is critical in evolving healthcare systems that face rising demands for personalized, preventive, and patient-centered care. As healthcare continues to shift towards value-based models, pharmacists who understand the holistic nature of health are better positioned to contribute meaningfully, ensuring that patients receive not only effective treatment but also compassionate and comprehensive care.

## References

1. Pharmacy Is Right for Me: *History of Pharmacy* (accessed October 7, 2022): pharmacyforme.org.
2. <https://www.express-scripts.com/pharmacy/blog/history-of-pharmacy>
3. J Zhang, T Wang Molecular biology will become the core course of higher pharmacy in the 21st century[J] *Pharmaceut Edu*, 18 (3) (2002), pp. 25-27
4. WT Wu Life sciences and higher pharmaceutical education[J] *Pharm Edu*, 17 (2) (2001), pp. 1-4
5. <https://www.intechopen.com/chapters/78946>
6. <https://ezyschooling.com/parenting/expert/adopting-holistic-approach-to-education>
7. Xubin SUO, Gang CHEN, Fenyun SONG, Ken CHEN, Han ZHANG, Holistic Integrative Pharmacy and its application in educational practice, *Journal of Holistic Integrative Pharmacy*, Volume 1, Issue 2, 2020, Pages 97-101
8. Fittler A, Nagy G, Füstös KM, et al. Is present pharmacy education adapted to needs? Survey results from young practitioner views regarding pharmacy education outcome towards a national reform in Hungary. *Saudi Pharmaceutical Journal*: 2022 Feb;30(2):132-137.
9. Arakawa N., Bruno A., Bates I. A Global Comparison of Initial Pharmacy Education Curricula: An Exploratory Study. *INNOVATIONS Pharm*. 2020;11:18. 10.24926/iip.v11i1.2093. [Europe PMC free article] [Abstract] [crossref] [Google Scholar]
10. Choi, et al.: Perception and Expectation of Pharmacy Students, *Indian Journal of Pharmaceutical Education and Research* | Vol 55 | Issue 1 | Jan-Mar, 2021, 63-69.
11. <https://timesofindia.indiatimes.com/blogs/voices/pharmacy-education-in-india-is-there-a-dire-need-of-updating-the-current-curriculum/>
12. <https://iimtu.edu.in/blog/innovations-in-shaping-the-future-of-pharmacy-education-a-prescription-for-success/>