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FICCI

# White Paper on Synergizing Healthcare Proficiencies through Interdisciplinary Education



FICCI HEAL 2024
HEALTH + ENTERPRISE + LEARNING

Swasth Bharat, Viksit Bharat

# Foreword by Symbiosis International University

The healthcare sector remains fundamental to the progress and well-being of any nation. In India, as we strive to achieve Universal Health Coverage (UHC), a major concern is the shortage and unequal distribution of healthcare professionals across disciplines such as medical education, nursing education, allied healthcare education, healthcare management, and public health. Equally pressing are the gaps in health skills and professional competencies required to meet the evolving demands of the healthcare industry.

This White Paper brings into focus several critical areas that need urgent attention within healthcare academia. It emphasizes the need to address skills gaps across various healthcare professions, including public health professionals, biological sciences, and sports sciences, highlighting the enhancement of core competencies such as team management, emergency response and the integration of technologies including digital health technologies. The issue of brain drain, where highly skilled professionals seek opportunities abroad, further compounds the challenge of maintaining a qualified, skilled & competent workforce.

To address these complexities, unfolding of conventional educational and training pedagogies is the felt need of the hour. This includes innovations teaching, training and assessments to ensure attainment of training and learning outcomes. Simulation Based Education (SBE) and training offer new possibilities for skill development, allowing practitioners to gain hands-on experience in a controlled, risk-free environment. This approach spreads across the spectrum of skilling, up-skilling and re-skilling to ensure that the healthcare workforce is competent throughout their professional career. However, decay and decline in skill sets and proficiencies due to a lack of continuous professional development and upgradation results in a compromise in the quality of healthcare services provided. Compounding this is an absence of standardization in training curricula across different training programs

The role of professional associations in ensuring adherence to high standards and fostering a culture of continuous learning is crucial. These associations can also spearhead efforts to standardize the curricula across healthcare fields such as medical education, nursing education and others, facilitating implementation of inter-professional health education and ultimately ensuring professionals meet a uniform level of competence, regardless of their geographic location.

Academic institutions, as a nursery and a perineal source for supplying trained, skilled and a competent workforce, should be committed to addressing these challenges and advancing healthcare education that is responsive to these challenges. Through innovative curricula and partnerships with stakeholders including academia and industry across domains, we must aim to develop a workforce that is skilled, adaptable and equipped to handle the healthcare needs of the future.

We encourage all stakeholders including academicians, researchers, regulators, policymakers, industry and civil society at large to consider the recommendations presented in this White Paper as we work together to create a sustainable and equitable healthcare system in India, which could be replicated globally across geographies.



**Dr. Rajiv Yeravdekar**
Provost,
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# Foreword by FICCI

As India's healthcare industry, we stand at a critical juncture where the traditional paradigms of medical education no longer suffice to meet our nation's burgeoning healthcare needs. The stark reality confronting us is not merely a shortage of healthcare professionals, but a pressing need to revolutionize how we educate and train our future healthcare workforce.

Our current medical education system, while built on strong foundations, was designed for a different era. Today's healthcare landscape demands professionals who are not only clinically competent but also digitally fluent, adaptable, and capable of providing comprehensive, patient-centered care. The COVID-19 pandemic has starkly highlighted these gaps in our educational framework, demonstrating the urgent need for healthcare professionals who can navigate complex health challenges with agility and innovation.

Our nation's goal of achieving Universal Health Coverage cannot be realized without reimagining medical education. We need to develop educational models that not only increase the quantity of healthcare professionals but fundamentally enhance the quality and relevance of their training. This includes embracing technologies that enable remote learning, creating immersive clinical experiences, and fostering a culture of continuous professional development.

Globally, medical students are practicing complex procedures in virtual reality environments, nursing students collaborating with AI-powered diagnostic tools. However, addressing the skill gaps in our country requires a comprehensive approach that goes beyond technology and digital solutions alone.

By integrating diverse knowledge areas, we need to advocate for an educational model that promotes a blend of practical skills, theoretical insights, and ethical awareness. Such an approach will empower healthcare professionals to tackle complex health challenges, from addressing population health disparities to managing resource constraints in high-pressure situations.

The integration of diverse pedagogical approaches – from flipped classrooms to problem-based learning, from telemedicine training to community-based education – represents our commitment to nurturing healthcare professionals who are truly prepared for 21st-century challenges. This White Paper emphasizes the importance of strengthening core competencies.

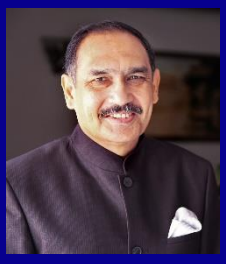
FICCI's Health Services Committee brings together leaders and experts across the healthcare spectrum to drive reforms, innovate policies, and champion initiatives that address pressing industry challenges. Through collaborative efforts, FICCI is committed to fostering an enabling environment for healthcare advancement, aiming to improve accessibility, quality, and sustainability across the sector.

This White Paper, in collaboration with Symbiosis International University, is a testament to FICCI's continued dedication to addressing skills gaps and enhancing healthcare competencies through interdisciplinary education and training.



**Dr Sanjeev Singh**

Co-Chair-



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Co-Chair-

FICCI Health Services Committee







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# Executive Summary

India's healthcare system is grappling with a significant shortage and uneven distribution of healthcare workers, impeding the goal of Universal Health Coverage (UHC). Although healthcare worker density has improved from 13.6 per 10,000 inhabitants in 2005 to 20.6 in 2024, it remains below the WHO's recommended 44.5 per 10,000 population. Disparities are pronounced, with urban areas having four times the doctor density compared to rural regions, further exacerbating access issues.

The shortage of Allied Healthcare Professionals (AHPs) is particularly acute, with a deficit of 6.4 million professionals. Current infrastructure meets only 4% of the demand and the distribution of AHPs is highly uneven across states, with significant regional disparities.

The healthcare education sector has expanded, with more medical colleges and an increase in postgraduate seats, but the concentration of nursing institutes in a few states highlights geographic imbalances. Skill gaps are prevalent across professions: doctors often lack team management and emergency response skills, while nurses face challenges in adhering to procedures and using technology. Technicians struggle with equipment maintenance and statistical knowledge.

To address these challenges, it is essential to implement continuing education programs, promote cross-skilling, and foster multi-disciplinary collaborations. Expanding telemedicine, offering financial incentives for rural service, and improving working conditions in underserved areas are also critical. Public-private partnerships can enhance training capacity, while task shifting and expanding community health roles can optimize the use of available human resources, helping bridge the gap and improve healthcare access across India.

# 1. Landscape analysis and need gap analysis

For healthcare delivery to be optimally effective, health systems must ensure an adequate level and equitable distribution of human resources across healthcare facilities. India is among the 57 countries facing a clear shortage of health workers. According to WHO recommendations of 44.5 doctors, nurses, and midwives per 10,000 inhabitants, India's national density is at 20.6. Although this is a significant improvement from the projected 13.6 per 10,000 in 2005, the distribution of healthcare professionals across states remains uneven. There are considerable disparities between urban and rural areas, with the density of doctors in urban regions being four times higher than in rural areas. The availability, distribution, and quality of human resources for health (HRH) are critical to achieving Universal Health Coverage (UHC) in lower-to-middle-income countries (LMICs) like India.

There is an increasing emphasis on cross-skilling initiatives to equip Indian nurses with the essential skills and qualifications to meet the specific healthcare demands of various countries. Additionally, the adoption of technologies fosters growth across multiple sectors worldwide, including healthcare, where there is a rising demand for home healthcare services, such as physiotherapy, pain management, and chronic disease care. Furthermore, the population served per government hospital bed is 2000, and per government hospital is 100,000. The Functional distribution of health workers is doctors (20%), Nurses (55%), Technicians ( 20%) and Administrative and Support functions ( 5%). The shortage of Allied Healthcare Professionals (AHPs) in India, estimated at over 64 lakh, necessitates urgent action.

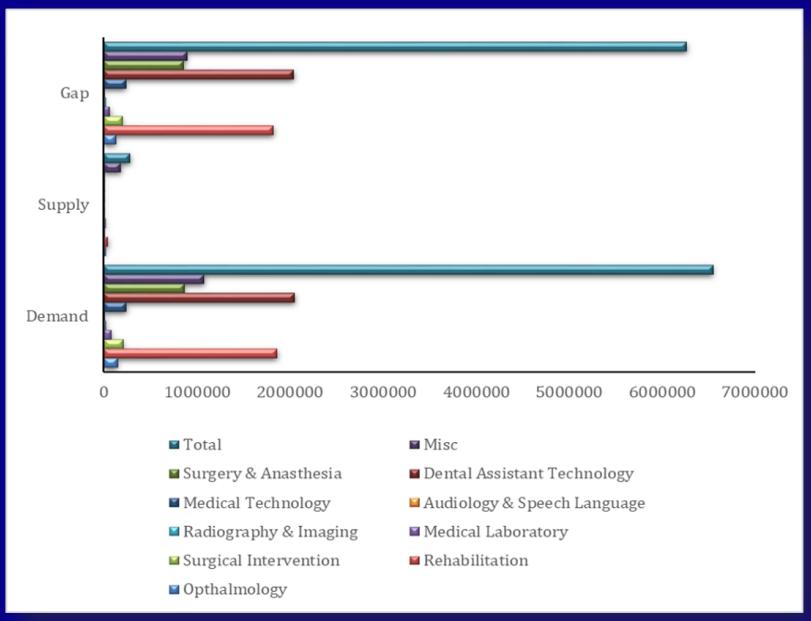



Table 1: Market Demand, Supply, and Gap of Allied Health Professionals.

Moreover, the existing infrastructure can only supply 4% of the demand for AHPs, leading to a deficit of 6.2 million professionals across the country. Even the existing supply of AHPs is unevenly distributed across geographies, inadequately trained, and lacks female participation. There is wide variation in the distribution of AHPs across states. The regional distribution of allied healthcare professionals in India is extremely skewed, with the density ranging from Punjab (21.3) AHP per 10,000 professionals to Jharkhand (0.3) AHP per 10,000 professionals (FICCI and KPMG, 2022). Brain Drain: Losing quality AHPs to advanced healthcare systems further exacerbates this shortage. Highly trained AHPs are often attracted to opportunities abroad, where better infrastructure, training, and compensation are available. This migration depletes the already limited pool of skilled professionals, making it even more challenging to meet the population's healthcare needs.



1 Human resource shortage in India's health sector: a scoping review of the current landscape, BMC Public Health
2 Availability, Distribution And Utilization Of Health Care Services In Kerala
3. New Age Healthcare Delivery Models in India, FICCI and KPMG

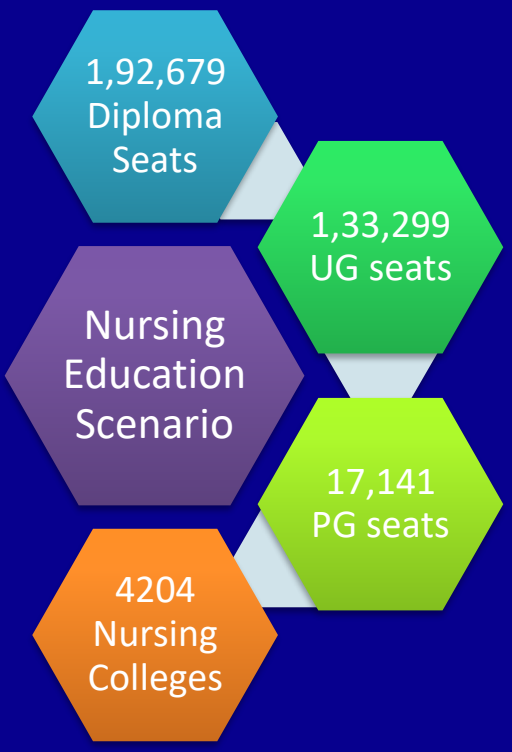
# 2. Existing Educational Programs for Healthcare Professionals

As regards medical education, as of 12th August 2024, there are:

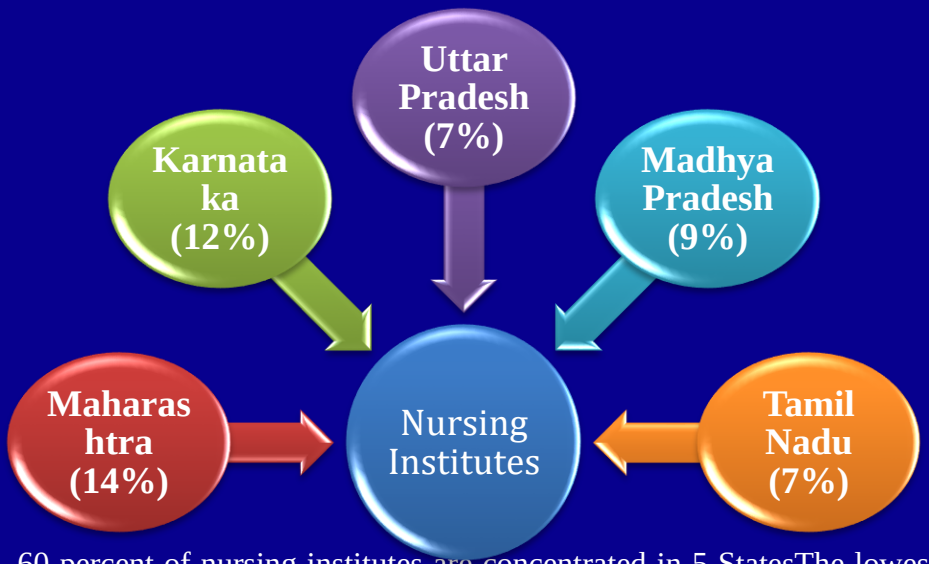
**Medical Education Scenario**

- 706 Medical Colleges
- 70,645 PG seats for 23-24
- 1,08,915 UG seats

Corresponding figures for nursing education are:




India witnessed a 74 percent growth in postgraduate (PG) seats and 81 percent growth in Diplomate of the National Board (DNB) seats between 2017-22 across government and private medical colleges.




Furthermore, approx. 60 percent of nursing institutes are concentrated in 5 StatesThe lowest number of institutes is in Northeastern states, such as Bihar, J&K, Himachal Pradesh, and Uttarakhand. The postgraduate medical education scenario in India emphasizes a structured and competency-based approach designed to develop skilled specialists who can address clinical and community health needs. Regulated by the National Medical Commission (NMC), the courses typically span two years for diploma and three years for degree programs.

4 National Medical Commission
5 Ministry of Health and Family Welfare , Press Information Bureau
6 Strengthening healthcare workforce in India:the 2047 agenda, FICCI and KPMG

The curriculum promotes self-directed learning, ensuring students gain essential theoretical knowledge, practical skills, research capabilities, and professional attitudes, including effective communication. A significant focus is placed on community-based activities, aligning medical training with the population's healthcare needs. Learning methods include lectures, seminars, journal clubs, clinical meetings, group discussions, and active participation in research relevant to each specialty. Furthermore, an effective faculty-to-student ratio allows personalized mentorship, facilitating in-depth learning. Students undergo cumulative assessments, with final examinations at the end of the course duration, ensuring their readiness as medical specialists. The curriculum's blend of theoretical, practical, and research components aims to produce well-rounded doctors equipped to meet India's growing healthcare challenges.

On September 26, 2024, Union Health Minister J.P. Nadda announced plans to increase the number of medical colleges from 706 in 2023-24 to 766 in 2024-25, reflecting an 8% rise. This expansion continues a decade-long trend, nearly doubling the number of colleges from 387 in 2013-14 to 766 by 2024-25. However, concerns have emerged regarding the quality of education, infrastructure, and the shortage of qualified faculty accompanying this rapid growth. Of the 766 medical colleges, 423 are government-run, while 343 are privately operated. Despite the 82% increase in the number of medical colleges and a 112% rise in MBBS seats, a substantial gap persists.

India has made significant progress in expanding medical education, but postgraduate (PG) medical education faces distinct challenges. A major issue is that many MBBS graduates are unable to pursue a specialization, resulting in a shortage of highly skilled specialists. Moreover, the geographic distribution of medical colleges remains uneven, with most located in southern states, limiting access to quality medical education elsewhere. Additionally, the curriculum lacks emphasis on critical areas such as medical ethics, health economics, and behavioural sciences. Research in medical colleges is often performed as a formality, with little consideration given to its value, impact, or practical outcomes. There is also a need for integrating contemporary skillsets such as Digital Health in the medical education curriculum.

The emigration of nurses from India is having a significant impact on the domestic healthcare system. Despite the country's capacity to train a substantial number of nurses and midwives, there is a notable shortage of their availability in critical healthcare centers. Both private and public entities, including commercial agencies, nursing institutions, and language schools, play a pivotal role in facilitating this migration. These organizations often tailor their curricula and provide language and cultural training to align with the healthcare workforce demands of foreign countries experiencing shortages. Many nursing colleges in India explicitly prepare their students for international employment markets, collaborating with recruitment agencies to expedite the migration process, sometimes even before students complete their professional licensing exams. This trend of preparing nurses for overseas employment contributes to a significant shortfall in the domestic healthcare workforce. Nurses who migrate are frequently offered lucrative employment packages, including competitive salaries, comprehensive healthcare benefits, family visa support, and other incentives, making foreign employment highly attractive. Consequently, this focus on exporting nurses exacerbates the staffing challenges within India's healthcare system.



7 The New Indian Express: Almost half of India's nurses are trained in five southern states:
8 Business Today: Can India maintain educational standards and meet healthcare needs?

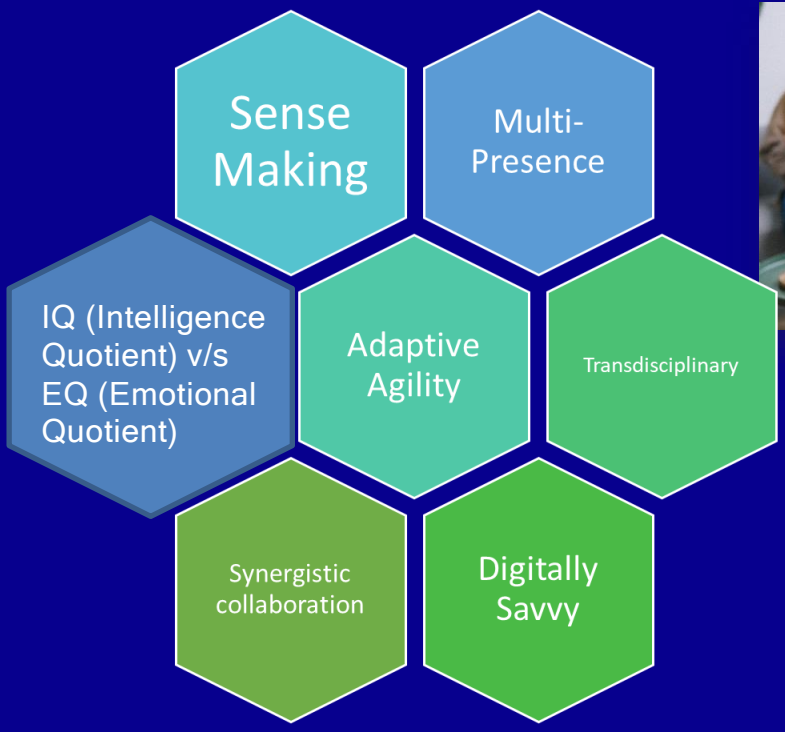
# 3. Discordance in the on-campus training programs

1. Title of the program
2. Eligibility criteria for enrolment
3. Syllabus: Number of courses and their titles
4. Chronology of the courses in the syllabus
5. Credits of each course.
6. Incorporation of common value added courses, skill development, ability enhancement, multi-disciplinary courses, and vocational courses - as per provisions of the NEP 2020.
7. Pedagogy of academic instructions
8. Curriculum (session plan)
9. Stints of experiential learning and their nomenclature viz. Observership / Summer Internship / job training, etc.
10. Assessments.
11. Objective Structured Clinical Examination (OSCE)
12. Duration of the program.
13. Title awarded.

Programs offered through online and digital and hybrid modes are not commented upon.



# 4. Required Skill Sets and Competencies in different healthcare professionals











- **Doctors:** Clinical expertise, patient communication, interdisciplinary collaboration, continuous learning and adaptability, critical thinking and problem-solving, ethical decision-making, emotional intelligence, cultural competency, research and evidence-based practice, time management, and patient advocacy.

- **Nursing Professionals:** Nursing professional expertise, Patient communication, teamwork and collaboration, critical thinking and problem-solving, emotional intelligence, cultural competency, patient advocacy, ethical decision-making, time management, and continuous professional development.

- **Allied Health Professionals**: Attention to detail, equipment operation and maintenance, problem-solving, adherence to safety protocols, quality control, time management, effective communication, teamwork, and continuous learning to stay updated with technological advancements.

- **Public Health Professionals:** Understanding Healthcare Systems, Emergency Preparedness and Response, Community Participation and Health Education

- **Mental Health Professionals:** Knowledge of Mental Health, Assessment Skills, Management Planning, Communication and Empathy, Advocacy, Teamwork and Collaboration.

- **Management Professionals / Administrator**: Project management, Crisis management, Ethical decision-making, Negotiation Skills, Consultant ego management, Marketing and public relations, human relations management, and Customer service orientation.

- **Life Science Graduates:** Advanced Scientific Knowledge, Technical Proficiency, Data Analysis, Research Skills, Regulatory Knowledge, and Problem-Solving.

# 5. Identified Skill Gaps

**Doctors:** Insufficient ability to manage personnel working across different specialties, Inadequate ability to use computers and access hospital information systems. Empathy for patients, Inadequate skills to work in teams, Inadequate ability to use computers and access hospital information systems, Inadequate ability to prescribe medicines by the molecular name, Inadequate knowledge of hospital infection control management, Inadequate orientation towards emergency management and disaster management.

**Nursing Professionals:** Inability to follow standard operating procedures, Inadequate staff management skills, Inadequate communications skills, especially when dealing with international clientele, Inadequate exposure to technology, Inadequate ability to administer medicines, Inadequate physiological knowledge, Inadequate knowledge of drugs, Inadequate ability to handle equipment and instruments appropriately.

**Allied Health Professionals:** Inadequate statistical knowledge, Inadequate ability to guide technicians / technical assistants, Inadequate ability of equipment maintenance management.

**Management Professionals / Administrator:** Technological Proficiency, Leadership and Strategic Management, Financial Acumen, Regulatory and Compliance Knowledge, Communication and Interpersonal Skills, Cultural Competency, Change Management.

**Mental Health Professionals:** An inability to have sound knowledge about the entire spectrum of mental health, including psychopathology. Also, inability to assess individuals with mental health issues. An inadequate ability to develop comprehensive management plans, have good communication skills, and being empathetic. The most important is an inability to understand and be compassionate while working in teams and collaborating on mental health advocacy.

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**Public Health Professionals:** Public health professionals face several skill gaps that need to be addressed to meet the evolving demands of the field. One major gap is in data analytics and interpretation, where many professionals lack the proficiency to analyze complex health data and use it effectively for decision-making. Additionally, there is a growing need for expertise in digital health and technology integration, as many public health professionals are not fully equipped to utilize digital tools, such as health informatics and telehealth platforms, to enhance their practices. Policy development and advocacy are other areas where skill gaps exist, with limited experience in influencing policy decisions and advocating for critical public health issues

**Life Science Graduates:** Biotechnologists face several skill gaps that can impact their effectiveness and career progression. One significant gap is in data analysis and bioinformatics, where many professionals lack the advanced skills needed to analyze and interpret large datasets, such as those generated in genomics and proteomics. There is also a gap in regulatory knowledge, particularly in understanding the complex regulatory requirements for biotechnology products and ensuring compliance in research and development processes. Commercialization and business acumen is other areas where skill gaps exist, with limited understanding of how to translate scientific discoveries into marketable products or technologies. Furthermore, biotechnologists often have limited knowledge of intellectual property (IP) management, which is crucial for protecting innovations in the biotechnology sector. Lastly, interdisciplinary collaboration skills are sometimes lacking, which can hinder effective teamwork with professionals from other fields, such as medicine, engineering, and business.



# Existing Educational Programs Available in the Market for Healthcare Professionals

- Doctors: MBBS, MD/MS, MCh /DM and DNB
- Nursing Professionals: ANM, GNM, PBBSc Nursing, BSc, MSc, PhD.
- Allied Health Professionals: Certificate, Diploma, Advanced Diploma, Graduation, Post Graduation. Various trade specific professional upgradation programs.
- Healthcare Management Professionals / Administrators: BBA, BHA, (MD-Hospital administrator), MHA, MBAHHM, PhD
- Public Health Professionals: BSc (Public Health), BPH, MPH, PhD
- Mental Health Professionals: BA & MA/ BSc in Clinical Psychology, & MSc in Psychology, BSc (Mental Health), PhD in Psychology
- Life Science Graduates: BSc, MSc, PhD



# 6. Fortification of Existing Healthcare Programs.

**Doctors:** Programs in Integrative Medicine, Training in Telemedicine, Personalized Medicine (Precision Medicine), Advanced Surgical Techniques, Medical Informatics and management / administrative aspects, Clinical Research Management including conduct of clinical trials.

**Nursing Professionals:** Nurse Practitioner in Critical Care (NPCC), Nursing Competency Enhancement Bridge Programme, MBA/MHA in Nursing administration, Nursing Education, Psychiatric Mental Health Nurse Practitioner (PMHNP) programs, Diabetic Educator

**Allied Health Professionals:** Programs in Advanced Diagnostic Imaging (with niche specializations in each domain e.g. within radiology - specialization in USG / CT / MRI / PET; within Dialysis technology - specialization in hemo / peritoneal dialysis / CRRT), Clinical Research Coordination, Telehealth Technologies, Assisted / Supportive & Rehabilitative Care, Assisted Reproductive Technology, food systems, sustainable diets, food security, agriculture, nutritional and health linkages, nutrition and gut microbiome, AI, ML in nutrition research and practice

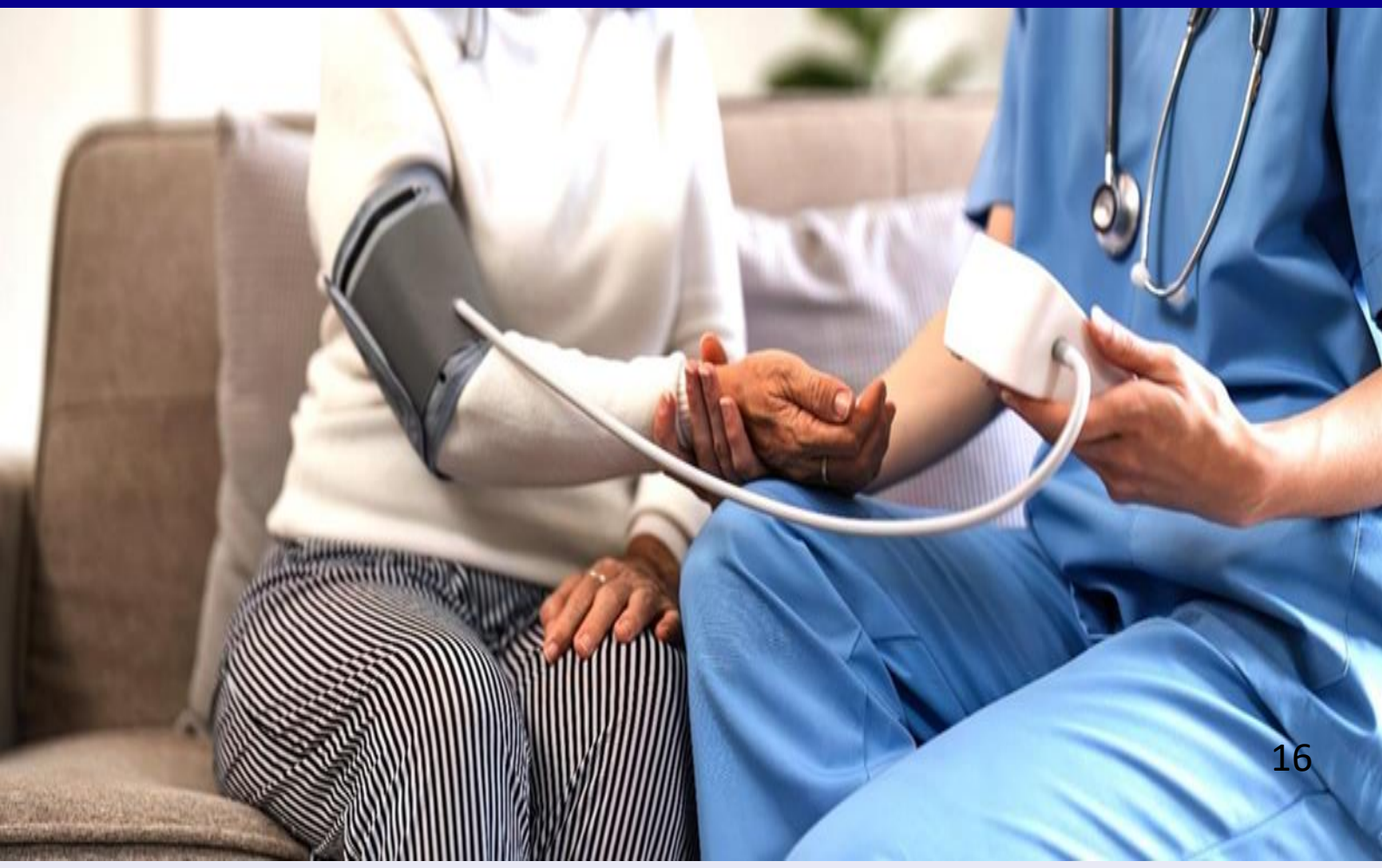


**Healthcare Management Professionals / Administrators:** Global Healthcare Management, Healthcare diplomacy, internationalization in healthcare, digital health, Healthcare entrepreneurship and Innovation including startups, Climate change & Sustainability, Data Analytics for Healthcare Management, and Health Economics and Policy**.**

**Public Health Professionals:** Program Planning and Evaluation, Clinical trials, Policy Analysis and Advocacy, Digital Health Integration, Big data analytics and predictive modeling, bioinformatics (programming skills)

**Mental Health Professionals:** Programs in Mental Health Related Health Record systems, Telehealth, Cultural competency & diversity training regarding mental health and social psychology.

**Life Science Graduates:** Epigenetics, Biomaterials and tissue engineering, Drug Discovery Using iPSC Models for Neurodegenerative Disorders, Biological Evaluation and Cytotoxicity of Antifungal Molecules, Quantitative Methods for Screening Antimicrobial Resistance, (Personalized) Genomics, Genomic technologies and clinical applications, Genetic counseling, Clinical genetics and genetic testing, Molecular diagnostics and clinical applications, Biomarker Discovery and Predictive Modeling for Disease Diagnosis.



# 7. Pedagogies and Technologies for Professional Development in Healthcare.

**1. Doctors:**
**Technologies**: AI-based diagnostic tools, Virtual Reality (VR) for surgical simulations, Robotic Surgery, Telemedicine platforms, Big Data Analytics for Personalized Medicine, and Genomic Sequencing.
**Pedagogies**: Case-Based Learning (CBL), Simulation-Based Training, Peer Learning Platforms, Immersive VR/AR Learning Environments, Online Modules with Interactive Learning Platforms, Problem-Based Learning (PBL).

**2. Nursing Professionals**
**Technologies:** AI-powered patient care platforms, Wearable Health Devices for patient monitoring, Telehealth Nursing Platforms, EHR Systems, and Simulation Labs for advanced nursing techniques.
**Pedagogies:** Competency-Based Learning, Blended Learning (Online + In-Person), Simulation-Based Clinical Education, Collaborative Learning Models, Reflective Practice in Clinical Decision-Making, Virtual Patient Interaction Scenarios.

3. **Allied Health Professionals**
**Technologies**: Advanced Imaging Technologies (MRI, CT, PET), AI-driven Diagnostic Tools, Wearable Rehabilitation Devices, Virtual Health Coaching platforms, 3D Printing for Prosthetics, Clinical Decision Support Systems.
**Pedagogies**: Case Study Analysis, Problem-Based Learning (PBL), Collaborative Learning through Interdisciplinary Teams, Simulation Labs, Webinars on Emerging Technologies, and Online Practicums.

**4. Management Professionals / Administrators**
**Technologies**: Data Analytics and Business Intelligence Tools ,Project Management Software (e.g., Asana, Trello), Customer Relationship Management (CRM) Systems, Cloud Computing Platforms ,AI for Predictive Analytics and Decision Making ,Automation Tools
**Pedagogies:** Case-Based Learning (CBL) with Business Case Studies **,**Simulation-Based Training for Strategic Decision Making, Interactive Workshops on Leadership and Management Skills, Online Learning Platforms with Real-World Business Scenarios**,** Peer Learning and Mentoring Programs **,**Problem-Based Learning (PBL) for Organizational Challenges.



**5. Public Health Professionals**

**Technologies:** Health Information Systems (HIS) , Geographic Information Systems (GIS) for Epidemiology, Mobile Health (mHealth) Apps ,Predictive Analytics for Disease Outbreaks, Telehealth Platforms ,Electronic Health Records (EHR)

Pedagogies: Case Studies on Public Health Interventions ,Problem-Based Learning (PBL) Focused on Public Health Issues, Simulation Labs for Emergency Preparedness ,Collaborative Learning Models with Focus on Community Health ,Webinars and Workshops on Emerging Public Health Trends, Reflective Practice on Public Health Campaigns

**6. Mental Health Professionals**

Technologies: Teletherapy Platforms , AI for Mental Health Diagnostics ,Digital Cognitive Behavioral Therapy (CBT) Tools ,Wearable Devices for Monitoring Mental Health, Virtual Reality (VR) for Exposure Therapy ,EHR Systems for Mental Health Records

Pedagogies: Simulation-Based Training for Therapeutic Techniques , Case-Based Learning (CBL) with Mental Health Case Studies, Reflective Practice and Supervision ,Interactive Online Modules with Role-Playing Scenarios, Peer Learning and Collaborative Therapy Models ,Problem-Based Learning (PBL) for Complex Cases

**7. Life Science Graduates**

Technologies: Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) and Gene Editing Tools, Bioinformatics Platforms, High-Throughput Sequencing Technologies, Laboratory Automation Systems, Advanced Microscopy and Imaging Technologies, AI and Machine Learning for Biotech Research

Pedagogies: Laboratory-Based Learning with Real-World Experiments, Case Studies on Biotechnological Innovations, Simulation-Based Training for Laboratory Techniques, Collaborative Projects with Industry Partners, Online Learning Platforms with Interactive Biotech Models, Problem-Based Learning (PBL) on Research Challenges and Solutions.



# 8. Challenges and Opportunities in Medical, Allied Health, and Nursing Education in India

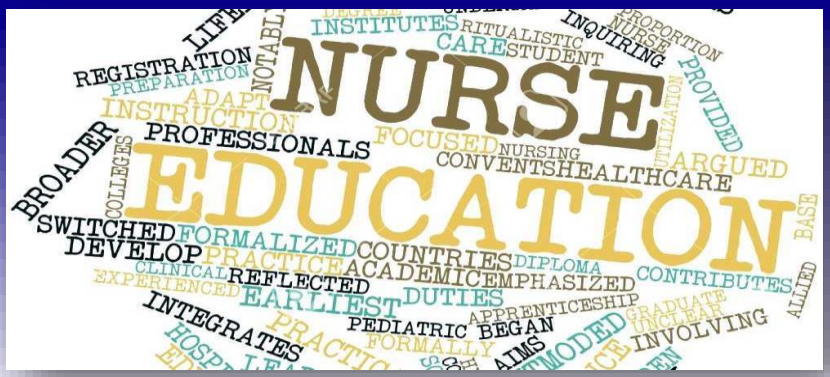
**Medical Education**



Medical education in India faces a multitude of challenges, primarily stemming from inadequate infrastructure and resources in many institutions. Numerous medical colleges struggle with outdated facilities, insufficient clinical exposure, and a shortage of qualified faculty, particularly in specialized areas. This deficiency can compromise the quality of education and mentorship for students, leaving them ill-prepared for real-world practice. Additionally, the existing curriculum often emphasizes theoretical knowledge at the expense of essential soft skills such as communication and empathy, which are crucial for patient-centered care. The rigid examination system can further stifle creativity and critical thinking, resulting in graduates who excel academically but may falter in applying their knowledge in practical settings. However, there are also significant opportunities for reform. The shift towards competency-based medical education (CBME) offers a framework for aligning training with the evolving needs of the healthcare system. Medical colleges can better equip graduates to meet contemporary healthcare challenges by focusing on practical skills and community engagement. Furthermore, integrating technology in education, such as telemedicine and simulation training, provides innovative ways to enhance learning outcomes and increase access to quality education, particularly in underserved areas.

**Nursing Education in India**

Nursing education in India grapples with several challenges that impact graduates' overall quality of training and readiness. Many programs suffer from insufficient clinical training opportunities, limiting students' hands-on experience and ability to function effectively in real healthcare environments. Additionally, nursing is often perceived as a secondary profession compared to medicine, resulting in inadequate faculty development and infrastructure investment. There is also a need for greater emphasis on emerging health issues within nursing curricula, such as mental health and preventive care, as graduates are frequently unprepared to address these contemporary challenges. On the positive side, the growing recognition of the importance of interprofessional education (IPE) encourages collaboration between nursing students and their medicine and allied health counterparts. This collaborative approach fosters teamwork and communication skills essential for effective patient care. Furthermore, the increasing focus on community health allows nursing programs to align more closely with national health priorities, preparing graduates to meet pressing healthcare demands.



## Allied Health Education in India

Allied health education in India faces unique challenges that hinder the effective training of professionals in this field. A prominent issue is the lack of standardized curricula across various allied health programs, leading to disparities in the knowledge and skills of graduates. Many allied health institutions also experience insufficient clinical training opportunities, limiting students' practical experience and readiness for real-world healthcare settings. Moreover, a lack of recognition and support for allied health professions often leads to limited career advancement opportunities and inadequate investment in infrastructure and faculty development. Despite these challenges, there are substantial opportunities for growth and improvement in allied health education. The rising emphasis on community health and preventive care presents an opportunity to align allied health programs with national health priorities, ensuring graduates are equipped to tackle contemporary health challenges. Additionally, integrating technology in education can enhance learning experiences and broaden access to training resources, particularly in rural areas. Promoting interprofessional education encourages collaboration among students in various healthcare disciplines, fostering a more integrated approach to patient care. As such, while challenges exist, the potential for transformative change in allied health education is promising, driven by innovative practices and a commitment to improving health outcomes.



# 9. Recommendations

1. **Relook and revamp of existing courses and programs and evolve consensus of terminologies:** To ensure healthcare professionals are equipped with up-to-date skills, including technological proficiency, clinical expertise, and emotional intelligence, curricula must be continually reassessed and aligned with industry advancements and evolving healthcare needs.

2. **Experiential Learning:** Experiential learning involves hands-on, practical experiences that enhance theoretical knowledge and skills through real-world application. This approach bridges the gap between classroom learning and clinical practice, providing valuable insights and problem-solving abilities.

3. **Use of new and innovative pedagogies for academic instruction e.g. Simulation for Training Healthcare Professionals**: Simulation-based training provides a safe, controlled environment where healthcare professionals can practice and refine their skills without risking patient safety. It enhances clinical decision-making, teamwork, and technical proficiency through realistic scenarios and immediate feedback.

4. **Obtain statutory approvals and gazette notifications:** Secure necessary regulatory approvals and publish official notifications to ensure healthcare programs comply with national standards and legal frameworks, supporting quality education and practice.

5. **Constitute professional bodies with local / regional / national representation:** Establish professional bodies at various levels to provide healthcare professionals with platforms for collaboration, knowledge-sharing, and advocacy, ensuring diverse representation and alignment with healthcare policies.

6. **Skilling, Upskilling and Reskilling:** Implement mandatory continuing education and professional development programs for healthcare workers to keep them updated with the latest advancements.

7. Cross-Skilling Initiatives: Equip healthcare workers with additional skills across different disciplines to increase their versatility, such as training nurses in basic diagnostic procedures or paramedics in emergency care.

8. 8. Multi-Disciplinary Collaboration: Foster collaboration between various healthcare professionals, enabling a team-based approach to patient care.

9. 9. E-Learning Platforms: Utilize online platforms to provide accessible and scalable training opportunities for healthcare workers, particularly in rural and remote areas.

**10. Telemedicine and E-Health:** Expand telemedicine services to extend healthcare access to underserved regions, reducing the burden on urban healthcare centers and allowing rural practitioners.

**11. Task Shifting:** Deployment of AI, Legalize and regulate task shifting, allowing trained non-physician healthcare workers to perform certain medical tasks, thereby optimizing the use of available human resources.

**12. Industry-Academia Linkages:** Collaboration between industry and academia fosters the development of cutting-edge research, practical training programs, and innovative solutions to healthcare challenges. These linkages also help align educational curricula with real-world industry needs, improving job readiness for graduates.

**13. Accreditation and Benchmarking:** Accreditation ensures that healthcare programs and institutions meet established standards of quality and effectiveness, promoting trust and credibility in the healthcare sector. Benchmarking against best practices and performance metrics helps organizations identify areas for improvement and maintain high standards of care.

# 10. Way forward – Medical, Nursing and Allied Health Professionals' Education in India

**1.Medical Professionals**

Integrating evidence-based medicine (EBM) and research in medical education is crucial for improving patient outcomes and ensuring high-quality care. Doctors must be trained to critically evaluate medical literature and apply research findings to their clinical practice. In India, while medical colleges are increasingly encouraging research, the scope and depth of training still require significant enhancement. According to a Medical Council of India report, only about 10% of medical colleges in the country have established dedicated research departments. More robust frameworks, including mandatory research electives, journal clubs, and evidence-based guidelines in clinical settings, can help foster a stronger research culture. This will enable doctors to engage in preventive health measures, particularly as lifestyle diseases account for approximately 60% of all deaths in India, highlighting the urgent need for early intervention.

Greater emphasis must be placed on preventive healthcare, given the rising burden of lifestyle diseases such as diabetes, hypertension, and cardiovascular conditions. Medical curricula should incorporate preventive medicine and public health modules, teaching doctors to identify and manage lifestyle-related diseases early. Programs focused on the early detection of cancers should be integrated through screening techniques, public health campaigns, and partnerships with community health programs. For instance, the Indian Council of Medical Research reports that cancer incidence is projected to rise to 1.57 million cases by 2025, emphasizing the need for proactive screening initiatives.

Innovative technology plays a critical role in modern healthcare. The adoption of tele-simulation, where students can practice medical procedures remotely via simulated environments, can bridge the training gap and reach underserved areas. Remote health services (telemedicine) can ensure that doctors are prepared to manage patients in rural and inaccessible areas, providing consultations, diagnoses, and follow-up care through digital platforms.

The development of Physician Assistants (PAs) is essential to alleviate the shortage of highly trained specialists. By strengthening the role of PAs, the healthcare workforce can better manage routine care, allowing doctors to focus on more complex cases. PAs can provide valuable support in preventive health and chronic disease management, enhancing the overall efficiency of healthcare delivery. Medical education should thus include inter-professional training with PAs, fostering collaborative care teams that enhance the quality of patient care and improve health outcomes.



9 Nearly six in 10 medical colleges in India did not publish any research in past 10 years, BMJ 2016
10 Top 10 Cancer States in India | 2023 Cancer Statistics in India

## 2. Nursing Professionals

Evidence-based practice (EBP) in nursing is a critical component of delivering high-quality, effective patient care. Nursing education in India must integrate research skills and the application of evidence-based guidelines into daily practice. This can be achieved through the inclusion of research methodology courses, critical appraisal workshops, and the integration of evidence-based protocols into clinical placements. However, the scope of research in Indian nursing colleges remains limited, often restricted to formalities rather than impactful studies. According to the Indian Nursing Council, only about 15% of nursing colleges have dedicated research programs, highlighting the need for greater institutional support for nursing research.

Nursing professionals can play a pivotal role in preventive health through community outreach and education programs, focusing on lifestyle modifications and the early detection of diseases like diabetes, hypertension, and cancer. The curriculum should incorporate modules on preventive care, equipping nurses with the knowledge to conduct screenings and engage in patient education around lifestyle diseases and cancer prevention. By strengthening the training and roles of Nurse Practitioners (NPs), the healthcare system can better address routine and preventive care needs.

Innovative technology like tele-simulation and remote health platforms must be integrated into nursing education. Tele-simulation allows nurses to practice clinical skills remotely, bridging the gap for students in rural areas. Remote health services, where nurses provide consultations and follow-ups via telemedicine, can extend healthcare services to the most underserved populations. Nursing curricula must incorporate these technologies, preparing students to operate in digital and telehealth environments. The future of nursing, particularly in the Indian context, lies in leveraging technology to reach underserved populations, promoting preventive health, and supporting early disease detection through innovative care delivery models.



### 3. Allied Health Professionals

To enhance the education system for allied health professionals (AHPs) in India, several key reforms are needed to address the current challenges. First and foremost is the standardization of the curriculum and accreditation processes. The quality of education across various institutions is inconsistent, leading to significant disparities in skill levels among AHPs. By developing a nationally standardized curriculum, core competencies can be uniformly taught, ensuring that students receive consistent, high-quality training regardless of where they study. This must be accompanied by a strong accreditation system that monitors and ensures the quality of allied health programs across the country, maintaining uniform educational standards.

In addition, it is crucial to strengthen the regulatory framework that governs allied health education and professional practice. While medical professionals benefit from well-defined regulatory systems, allied health professionals often face a lack of clear governance. Establishing a comprehensive regulatory body would oversee education, licensing, and practice standards, providing structure and support for AHPs and ensuring their integration into the broader healthcare system. Such a framework would create clear career pathways, improving the professional standing and recognition of allied health workers.

The quality of allied health education also depends heavily on the availability of trained faculty and modern infrastructure. Many institutions lack experienced educators and up-to-date facilities, which limits the quality of training. Investments in faculty development programs that provide continuous professional growth opportunities, as well as upgrading technological infrastructure such as laboratories and simulation centers, would help bridge this gap. The use of innovative technologies, including tele-simulation and digital learning platforms, would further ensure that all students, including those in remote areas, have access to cutting-edge educational tools and methods.

Furthermore, the curriculum should emphasize interdisciplinary collaboration and clinical exposure. AHPs work closely with other healthcare professionals in real-world settings, yet their education often lacks opportunities for collaborative training. Integrating inter-professional education where AHPs, doctors, and nurses train together would enhance teamwork skills and improve patient care. Additionally, increasing clinical placements and internships will allow students to gain practical experience in healthcare environments, better preparing them for their professional roles.

Finally, it is essential to improve career opportunities and recognition for AHPs to attract and retain talent in this sector. AHPs often face limited professional growth and advancement opportunities. Policies should focus on expanding roles for AHPs in areas such as public health, preventive care, and primary healthcare settings. Providing clear pathways for career advancement, including opportunities for further specialization and leadership positions, will make allied health professions more attractive and ensure a motivated, skilled workforce for India's healthcare system.



# About SIU

Symbiosis International (Deemed University) is a multi-disciplinary university offering its students and faculty a vibrant learning ecosystem designed around its multi-cultural and innovative ethos. Symbiosis was established in 1971 by Prof. Dr. S.B. Mujumdar, which was a ‘home away from home’ for International students. The Institution is based on the principles of Vedic thought of "World as One Family". The University's name fittingly captures the quintessence of the relationship with International students; a mutually beneficial bond between India and the International student community. Symbiosis is committed to building international understanding by offering quality education, and is resplendent of the activities and students of more than 85 countries.

Today the university has its campuses spread across four states and 6 cities in India and an International Off-shore Campus in Dubai, U.A.E. All the university campuses epitomize the Symbiosis vision, 'Promoting International Understanding through Quality Education' and are a beehive of international students from all across the globe, being privy to Indian culture and hospitality.
The University has been awarded Category-I status by UGC, and an ‘A++’ grade by National Assessment and Accreditation Council (NAAC). It has been ranked 31st in India by National Institutional Ranking Framework (NIRF) 2024, and 10th by Atal Ranking of Institutions on Innovation Achievement (ARIIA) 2021.Symbiosis International (Deemed University) has achieved a significant milestone by being listed in the QS World University Rankings 2025. The university is ranked globally in the 641-650 range, 31st in the world and first in India for Employer Reputation. It is also ranked as the second-best private university in India.

Internationally QS World University Rankings by Subject 2024 has ranked Symbiosis International (Deemed University) 140th Globally & 6th in India in Business & Management Studies; 389th Globally & 10th in India in Social Sciences & Management; and in the 551-600 band Globally & 12th in India in Computer Science & Information Systems. QS World University Rankings: Asia 2024 has ranked the university 28th in India, 53rd in South Asia, and has been placed within the 261-270 band in Asia. The Times Higher Education (THE) World University Ranking 2023 has ranked the University amongst the top 1000 Universities in the World, and 23rd in India. THE World University Rankings 2023 by Subject has ranked the university in the 401-500 band in Social Sciences, in the 501-600 band in Business & Economics, in the 501-600 band in Accounting & Finance, in the 401- 500 band in Computer Science, and in the 601-800 band in Engineering. It is the only University to have received the Asia Pacific Quality Label.

The University has established the Symbiosis Medical College for Women. The medical college and its attached Symbiosis University Hospital and Research Centre have state-of-the-art infrastructure and facilities.
Symbiosis International (Deemed University) is committed towards generation of knowledge, innovations and its contribution towards the development of the Nation.

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# About FICCI

Established in 1927, FICCI is the largest and oldest apex business organization in India. Its history is closely interwoven with India's struggle for independence, its industrialization, and its emergence as one of the most rapidly growing global economies.

A non-government, not-for-profit organization, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies.

FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.

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# Thank you