International Conference Proceeding
on
"AI and Nursing: Education, Research, Care, and Leadership"

Organized by

MKSSS Smt. Bakul Tambat Institute of Nursing Education,

Karvenagar, Pune-52.

Sponsored by MUHS Nashik

DISCLAIMER

MKSSS BTINE FACULTY PHOTO

MAHARSHI KARVE STREE SHIKSHAN SAMSTHA'S
SMT. BAKUL TAMBAT INSTITUTE OF NURSING EDUCATION
(MKSSS BTINE),
KARVENAGAR, PUNE- 411052.

International Conference
on
"AI and Nursing: Education, Research, Care, and Leadership"

2nd and 3rd January 2026

Organized by

MKSSS Smt. Bakul Tambat Institute of Nursing Education,
Karvenagar, Pune-52.

Sponsored by MUHS Nashik

NAAC 'A' Grade Accredited
Email: confbtine@gmail.com, btine@maharshikarve.org
Phone: +918847788190, +917499332095
Website: www.mksssbtine.ac.in

MNC Credit Points

Hybrid Mode (only for International Delegates)

Venue
Auditorium at 4th floor of MKSSS Dr. Bhanuben
Nanavati College of Architecture for Women,
Karvenagar, Pune-52.

Message from organizing chairperson

Artificial Intelligence (AI) is rapidly transforming healthcare and redefining the scope and practice of nursing across education, research, clinical care, and leadership. The international conference "AI and Nursing: Education, Research, Care, and Leadership" is organized to provide a scholarly and collaborative platform for nursing students, educators, administrators, and researchers to engage with these emerging changes critically.

In nursing education, AI enhances learning through adaptive simulations and personalized instruction, while raising concerns about over-dependence and the potential erosion of critical thinking. In nursing research, AI enables large-scale data analysis and accelerated discovery, yet poses risks of bias and inequity if ethical scrutiny is insufficient. In clinical care, AI supports decision-making and reduces administrative burden, but preserving the nurse's human presence, compassion, and relational trust, and patients' privacy remains fundamental. In leadership, AI offers nurses opportunities to influence innovation and policy while also challenging them to develop digital literacy and the confidence to shape technological discourse actively.

This conference invites participants to reflect on the strengths, weaknesses, opportunities, tensions, and responsibilities associated with integrating AI into nursing. Through expert presentations, interactive discussions, and group activities led by eminent national and international faculty, the conference aims to collaboratively develop transformative and ethically grounded strategies that ensure AI strengthens—rather than diminishes—the core values of nursing practice.

Dr. Meena Ganapathy,
Principal,
MKSSS BTINE, Pune.

Message from vice-chancellor

महाराष्ट्र आरोग्य विज्ञान विद्यापीठ, नाशिक
MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

डॉ. अजय साहेबराव चंदनवाले
एम.एस. (अस्थिव्यंगोपचार, पीएच्.डी. अस्थिव्यंगोपचार)
प्रभारी कुलगुरु

Dr. Ajay Sahebrao Chandanwale
M.S. (Orthopedics), Ph.D. (Orthopedics)
Acting Vice-Chancellor

Date: 15th December 2025

MESSAGE

I am happy to extend a warm welcome to all delegates, speakers, and participants of the International Conference on "Artificial Intelligence and Nursing: Education, Research, Care, and Leadership." This conference marks an important and timely step toward embracing the rapidly evolving landscape of health sciences and the increasing integration of digital technologies in healthcare.

Artificial Intelligence is already reshaping the way we teach, learn, conduct research, and deliver patient care. For the nursing profession—long recognized as the foundation and heartbeat of healthcare—AI presents tremendous opportunities to strengthen clinical decision-making, improve care processes, and advance evidence-based practice. At the same time, it brings forth the need for new competencies, ethical awareness, and leadership preparedness among nursing professionals.

I commend the organizers for creating this platform that fosters knowledge sharing, collaboration, and intellectual exchange. The diversity of contributions featured in these proceedings reflects the shared commitment of academicians, researchers, clinicians, and students to develop clarity, innovation, and future-readiness in nursing.

I am confident that the work presented through this conference will contribute significantly to capacity building, innovation, and quality enhancement in nursing education and practice. My sincere congratulations to the organizing committee, and I extend my best wishes for the continued success of this academic endeavour.

Dr. Ajay Sahebrao Chandanwale

दिंडोरी रोड, म्हसरूळ, नाशिक- ४२२००४ Dindori Road, Mhasrul, Nashik – 422 004
Tel : (0253) 2539110, 2539333, 6659110, 6659333
Website : www.muhs.ac.in   Email: vc@muhs.ac.in

Message from Dean Faculty of Nursing

It is with great respect and admiration that I extend my heartfelt greetings to Maharshi Karve Stree Shikshan Samstha (MKSSS) a trailblazing institution established by Bharat Ratna Maharshi Dhondo Keshav Karve, whose visionary commitment to women's empowerment through education has illuminated countless lives for over a century.

The Smt. Bakul Tambat Institute of Nursing Education, with its NAAC 'A' Grade accreditation and 26 years of distinguished service, stands as a beacon of excellence, compassion, and integrity in nursing education.

The International Conference on "AI and Nursing: Education, Research, Care, and Leadership" represents a pivotal moment in uniting global nursing professionals to critically examine the informative potential and ethical complexities of Artificial Intelligence. As we navigate this evolving landscape, it is imperative that we uphold the enduring values of our profession compassion, wisdom, and equity.

It is an honor to be part of this meaningful initiative. May this conference foster rich dialogue, collaborative innovation, and strategic foresight, empowering nurses to lead with clarity and confidence in an AI integrated future.

Dr. Sreelekha Rajesh,
Dean Faculty of Nursing,
MUHS, Nashik.

Message from Chairman

I deeply appreciate this and convey my best wishes for the International Conference on "AI and Nursing: Education, Research, Care, and Leadership" organized by MKSSS's Smt. Bakul Tambat Institute of Nursing Education, Karvenagar, Pune.

Artificial Intelligence (AI) is transforming every dimension of the nursing profession. As healthcare rapidly advances, AI-driven tools are reshaping the way nurses learn, make decisions, deliver care, and lead healthcare teams. The conference theme emphasizes the vital role of nurses in adopting AI, ensuring its ethical use, and preparing the nursing profession to lead in a digital future. This conference will encourage and provide a platform for nursing educators, clinical nurses, nursing researchers, and leaders to collaborate and innovate for the next era of quality nursing care through intelligent use of AI in health care. This conference will help nursing personnel stand up to the challenges with the knowledge and confidence needed to adopt and implement AI in health care. It will help levels to empower themselves in the world of digital health care.

Shri. Ravindra Deo,
Chairman,
MKSSS, Pune.

Message from Secretary

It gives me immense pleasure to extend a warm welcome to all participants of the International Conference on "AI and Nursing: Education, Research, Care, and Leadership." This conference comes at a pivotal time when Artificial Intelligence is increasingly influencing healthcare systems and redefining the scope and practice of the nursing profession worldwide.

Nursing has always stood at the intersection of science, compassion, and ethical responsibility. As AI becomes integrated into education, research, clinical care, and leadership, it is essential that nurses remain active contributors and thoughtful stewards of this transformation. This conference has been thoughtfully designed to encourage critical reflection, shared learning, and meaningful dialogue on how AI can be responsibly integrated while preserving the core values of nursing—human dignity, equity, wisdom, and compassionate care.

The conference provides a unique platform for nursing students, educators, administrators, researchers, and leaders to engage with eminent national and international faculty through presentations, interactive discussions, and collaborative activities. It aims to inspire innovation, strengthen AI literacy, and empower nurses to confidently participate in decision-making, policy development, and leadership roles in an evolving technological landscape, while preserving their presence and relational trust in patient care.

I am confident that this conference will foster rich academic exchange, stimulate new ideas, and contribute to the co-creation of transformative strategies that will shape the future of nursing. I wish the conference every success and hope that all participants find this experience intellectually enriching and professionally rewarding.

With best wishes,

Dr. P. V. S. Shastry,
Secretary,
MKSSS, Pune.

Message from Organizing Secretary

Artificial Intelligence–determined nursing excellence stands at the forefront of modern healthcare, serving as a powerful media of innovation and transformation in nursing profession. It represents our commitment to integrating advanced technologies with compassionate, ethical, and evidence-based nursing care. In today's rapidly evolving digital healthcare landscape, embracing AI is no longer optional—it is essential to ensure quality care, enhance clinical decision-making, and improve patient outcomes.

Through this international conference on "AI in Nursing: Education, Research, Care, and Leadership," we aim to collaboratively explore and co-create transformative strategies that attach artificial intelligence to strengthen nursing education, empower professionals, uphold ethical standards, and advance evidence-based practice across all levels of care.

This platform will provide a unique opportunity for nursing professionals, educators, researchers, and leaders to gain insights into emerging AI-driven tools, exchange innovative ideas, and collectively expand their knowledge and skills. We can better understand how AI can support nurses, not replace them, in delivering safe, personalized, and efficient healthcare.

On behalf of the MKSS BTINE team I am inviting all of you for this conference.

Mrs. Ujwala Jadhav,

Organizing Secretary,

Assist. Prof. MKSSS BTINE, Pune.

MAHARSHI KARVE STREE SHIKSHAN SAMSTHA'S
SMT. BAKUL TAMBAT INSTITUTE OF NURSING EDUCATION
(MKSSS BTINE),
KARVENAGAR, PUNE- 411052.

International Conference
on
"AI and Nursing: Education, Research, Care, and Leadership"
2nd and 3rd January 2026

Organized by

MKSSS Smt. Bakul Tambat Institute of Nursing Education,
Karvenagar, Pune-52.

Sponsored by MUHS Nashik

NAAC 'A' Grade Accredited
Email: confbtine@gmail.com, btine@maharshikarve.org
Phone: +918847788190, +917499332095
Website: www.mksssbtine.ac.in

MNC Credit Points

Hybrid Mode (only for International Delegates)

Venue
Auditorium at 4th floor of MKSSS Dr. Bhanuben
Nanavati College of Architecture for Women,
Karvenagar, Pune-52.

MKSSS:

Maharshi Karve Stree Shikshan Samstha, our parent body, has been committed to "Empowerment of Women through Education" for over a century. Maharshi Karve Stree Shikshan Samstha was founded by the great visionary and social worker Bharat Ratna Maharshi Dhondo Keshav Karve in 1896. The Samstha runs 75 branches with 14 higher education institutes providing education to 35000 girl students across branches. It has maintained the quality of education standards with a transparent administration.

MKSSS BTINE:

The Maharshi Karve Stree Shikshan Samstha's Smt. Bakul Tambat Institute of Nursing Education started on the campus of the Samstha in Pune in August 2000. The institute is committed to "Developing Conscientious, Confident, and Caring Quality Professionals of International Repute." The Institute is approved by the Indian Nursing Council, Delhi; Maharashtra Nursing Council, Mumbai; the Government of Maharashtra; and the Maharashtra University of Health Sciences, Nashik. The Institute is accredited with NAAC 'A' Grade. The Institute runs ANM, GNM, B.Sc. Nursing, P.B.B.Sc Nursing, M.Sc. Nursing and Ph.D. in Nursing. Clinical learning is conducted in the parent hospital i.e., Deenanath Mangeshkar Hospital, Pune. The institute has completed 26 years of excellence.

Theme of conference:

We are organizing an international conference on "AI and Nursing: Education, Research, Care, and Leadership" for nursing students, educators, administrators, and researchers. Our conference aims to explore how Artificial Intelligence (AI) is reshaping nursing through its impact on education, research, care, and leadership. In education, AI enhances learning through adaptive simulations, but it risks narrowing students' critical thinking if over-relied upon. In research, AI enables large-scale analysis and discovery, but it may perpetuate data bias and inequities without proper scrutiny. In clinical care, AI reduces administrative burden and supports decision-making, while preserving the nurse's presence and relational trust remains essential. In leadership, AI offers opportunities for nurses to guide policy and innovation, but also challenges them to develop confidence and literacy to avoid being marginalized in technological discourse.

This conference invites participants to reflect on the strengths, weaknesses, opportunities, tensions, and responsibilities involved in integrating AI into nursing, emphasizing the need for effective stewardship of this technology. Nurses must act as interpreters, skeptics, and advocates to ensure that AI strengthens, rather than diminishes, the core values of wisdom, compassion, and equity that define the profession. This conference will help collaboratively co-create transformative strategies for integrating AI in nursing education, research, care, and leadership at all levels. This conference will have presentations, interactive discussions, and group activities by eminent international and national nursing faculty.

Aim:

To collaboratively reflect on the strengths, weaknesses, opportunities, tensions, and responsibilities involved in integrating AI into nursing classrooms, research to bedside and boardrooms, emphasizing the need for effective stewardship of this technology.

Objectives:

1. To provide an innovative platform to collaboratively contemplate the opportunities and challenges in integrating AI in nursing education.
2. To provide a dynamic platform for knowledge exchange to contemplate the opportunities and challenges in integrating AI for nursing research.
3. To provide a forum to discuss and develop frameworks for integrating AI into clinical practice for nurses at all levels.
4. To examine the transformative strategies for integrating AI in leadership roles and policymaking.

MKSSS Patrons

Shri. Ravindra Gajanan Deo,
Chairman,
MKSSS, Pune.

Smt. Vidya Sanjay Kulkarni,
Vice Chairman,
MKSSS, Pune.

Dr. P.V. S. Shastry,
Secretary,
MKSSS, Pune.

Dr. Dhananjay Kulkarni,
LMC Chairperson,
MKSSS, Pune.

Organizing Committee

Organizing Chairman,
Dr. Meena Ganapathy,
Principal, MKSSS BTINE, Pune.

Organizing Secretary,
Mrs. Ujwala Jadhav,
Assist. Prof. MKSSS BTINE, Pune.

Resource Persons on 2nd January 2026

Dr. Rajrani Sharma,
Professor, Lone Star College
of Nursing, Texas, USA.

Dr. Sharadha Ramesh,
Dean, Faculty of Nursing, Vinayaka Mission
University, Pondicherry, Tamil Nadu.

Mr. David Puller,
Reference Librarian, Lone Star
College of Nursing, Texas, USA.

Dr. Sheela Upendra,
Dpt. Director & Prof.
Symbiosis College of Nursing, Pune.

Mrs. Sampada Vardhe,
Head of MKSSS-AIT, Center for Data
Science, Machine Learning & AI.

Mrs. L. Bijayalakshmi Devi,
Professor, MKSSS BTINE.

Mrs. Nupoor Bhambid,
Professor, MKSSS BTINE.

Resource Persons on 3rd January 2026

Capt. Dr. Indira Rani,
Director of Nursing, Yashoda Medicity,
Gaziabad, NCR.

Dr. Koustuv Dalal,
Prof. Public Health Science & Economist,
Mid Sweden University, Sweden.

Brig. Dr. Vandana Agnihotri,
Brig MNS SC, Pune.

Dr. Tripti Nanda,
Director of Quality and Nursing,
Noble Hospital, Pune.

Mrs. Jyoti Karande,
Asso. Professor, MKSSS BTINE.

Ms. Smita Lisham,
Asso. Professor, MKSSS BTINE.

Conference Schedule

Day 1- 02/01/2026 AI & Nursing: Education & Research		
Time	**Sessions**	**Resource Persons**
8 am-9 am	Registration and Breakfast/ Poster Presentation (Parallel Session)	
9 am-9.45 am	Overview of Conference Theme Connecting the dots: AI and Nursing: Education, Research, Care, and Leadership.	Dr. Meena Ganapathy, Principal, MKSSS BTINE, Pune.
9.45 am- 10.15 am	Inauguration of Conference	
10.15 am- 10.30 am	**Tea Break**	
10.30 am- 11.15 am	Innovations in Nursing Education with AI: the Global Scenario	Dr. Sharadha Ramesh, Dean, Faculty of Nursing, Vinayaka Mission University, Pondicherry, Tamil Nadu.
11.15 am - 12.15 pm	**Panel: AI tools in Nursing Education** 1. AI in personalized and adaptive learning platforms. 2. AI-driven simulations and virtual patients for skill development.	Chairperson: Nupoor Bhambid, Prof. MKSSS BTINE, Pune. Mr. David Puller, Reference Librarian, Lone Star College of Nursing, Texas, USA. Dr. Rajrani Sharma, Professor, Lone Star College of Nursing, Texas, USA.
12.15 pm – 1.00 pm	**Workshop:** 1. Simulation and Scenario. 2. Adaptive learning platforms.	Faculty MKSSS BTINE
1.00 pm – 1.30 pm	**Lunch Break**	
1.30 pm - 3.00 pm	**Panel: AI in big data analysis and review of literature.** 1. Opportunities for the latest ROL for nursing research with AI. 2. Opportunities for the latest data analysis using AI in nursing research.	Chairperson: Mrs. L. Bijayalakshmi Devi, Prof. MKSSS BTINE, Pune. Dr. Sheela Upendra, Dpt. Director & Prof. Symbiosis College of Nursing, Pune. Mrs. Sampada Vardhe, Head of MKSSS-AIT, Center for Data Science, Machine Learning & AI.
3.00 pm – 4.00 pm	**Group Activity:** hands-on AI tool for ROL and data analysis.	Faculty MKSSS BTINE
4.00 pm - 4.15 pm	**Tea Break**	
4.15 pm - 5.00 pm	**Cultural Events**	

Conference Schedule

Time	Sessions	Resource Persons
Day 2- 03/01/2026 AI & Nursing Care & Leadership		
8.00 am-9.00 am	**Breakfast**	
9.00 am-9.45 am	AI for patient monitoring and predictive care analysis.	Capt. Dr. Indira Rani, Director Nursing, Yashoda Medicity, Gaziabad, NCR.
9.45 am- 11.15 am	**Panel: AI in Nursing Care** a) Clinical decision support and workflow optimization. b) Patient monitoring and safety, and virtual nursing assistants.	Chairperson: Ms. Smita Lisham, Asso. Prof. MKSSS BTINE, Pune. Dr. Koustuv Dalal, Prof. Public Health Science & Economist, Mid Sweden University, Sweden. Capt. Dr. Indira Rani, Director Nursing, Yashoda Medicity, Gaziabad, NCR.
11.15 am- 11.30 am	**Tea Break**	
11.30 am- 12.15 pm	**Workshop:** on patient care-related predictive analysis and monitoring devices.	Faculty MKSSS BTINE
12.15 pm – 1.00 pm	**Lunch Break**	
1.00 pm –3.00 pm	**Panel discussion: AI in Nursing Leadership.** a) Advocacy for policy change and ethical leadership. b) Data-decision making and patient care improvement.	Chairperson: Mrs. Jyoti Karande, Asso. Prof. MKSSS BTINE, Pune. Dr. Tripti Nanda, Director of Quality and Nursing, Noble Hospital, Pune. Brig. Dr. Vandana Agnihotri, Brig MNS SC, Pune.
3.00 pm- 3.15 pm	**Tea Break**	
3.15 pm – 4.00 pm	**Group Activity:** Simulation scenario on AI & Nursing Leadership.	Faculty MKSSS BTINE
4.00 pm -5.00 pm	**Valedictory**	

Conference fees

Delegates	Conference fees up to 15th Dec.	Late registration (after 15th Dec.)	Spot registration
National	Rs. 2360 (including GST)	Rs. 2660 (including GST)	Rs. 2860 (including GST)
International	28 $	30 $	32 $

- Registration fees include a registration kit, breakfast, and lunch.
- Registration fees do not include accommodation.
- Concession of 10% for the members of the Association of Managements of Unaided Nursing Colleges of Maharashtra.

Committees	Faculty	Contact No.
Registration	Mrs. Ashwini Sutar Mrs. Rupali Dhume	9850771785 9370365383
Scientific	Mrs. L. Bijayalakshmi Devi Ms. Smita Lisham	9225504086 9823646344
Accommodation	Mrs. Jyoti Karande Mrs. Shital Chirke	9850140007 9923870088

- For detailed information on accommodation contact the above mentioned faculty.
- Accommodation charges are Rs. 300/- day.

Registration Details

Click here for registration or scan QR code for registration

- Last date for registration is 15th December 2025.
- For details, please contact the registration committee.
- Initiate the payment and keep a scan copy of the receipt.
- Fill the registration form and upload the payment receipt to complete the registration process.

Bank Details	
Bank Name	Canara Bank
Bank Account Name	Smt. Bakul Tambat Institute of Nursing Education.
Bank Account No	53392010044961
Bank Account Type	Savings account
Bank IFSC Code	CNRB0015339
Bank Branch Name	Karvenagar, Pune.

Guidelines for scientific paper presentation:
- Scientific paper presentations are invited on topics relevant to the theme of the conference.
- Papers on projects conducted using various research methods are invited.
- The conference scientific committee will appraise all papers.
- Only registered delegates are allowed to present papers/ posters.
- Time allotted for each presentation would be 5 minutes.
- Abstract should be within 300 words (excluding references) in TNR font 12 size, spacing 1.5.
- Abstract should be written in IMRAD format (Introduction, Methods, Results, and Discussion). The manuscript should be 2000-2500 words.
- All the research papers presented will be published in "Nurses Innovators Journal".
- Last date of submission is 15th December 2025.

Guidelines for poster presentation:
- Flex material only 1 meter. Width is 1 meter. Height is recommended for the poster.
- Graphs, Drawings, and Illustrations should be self-explanatory or have short notes.
- Space for display will be provided. Participants should make their own arrangements for other accessories.
- Only one poster per entry is allowed.
- Note: Kindly mail the content of the scientific/poster presentation on confbtine@gmail.com before 15th December 2025 as a soft copy with a PowerPoint presentation (up to 10 slides).
- It is mandatory to register for the conference to participate in the paper and poster presentation.

The best paper & poster will be awarded.

"Overview of AI and Nursing: Education, Research, Care, and Leadership."

Dr. Meena Ganapathy,

Organizing Chairman, Principal, MKSSS BTINE, Pune.

"When challenged by the rise of technology, as long as nurses are willing to grow professionally and become even better versions of the remarkable healthcare providers that they are today, human nursing practice will prevail."

J.A. Pepito, R. Locsin

Introduction:

Artificial intelligence (AI) is reshaping nursing through its impact on education, research, care, and leadership. In education, AI enhances learning with adaptive simulations but risks narrowing students' critical thinking if over-relied upon. In research, AI enables large-scale analysis and discovery, but it may perpetuate data bias and inequities without proper scrutiny. In clinical care, AI reduces administrative burden and supports decision-making, while preserving the nurse's presence and relational trust remains essential. In leadership, AI offers opportunities for nurses to guide policy and innovation, but also challenges them to develop confidence and literacy to avoid being marginalized in technological discourse. This conference invites participants to reflect on the opportunities, tensions, and responsibilities involved in integrating AI into nursing, emphasizing the need for effective stewardship. Nurses must act as interpreters, skeptics, and advocates to ensure that AI strengthens, rather than diminishes, the core values of wisdom, compassion, and equity that define the profession.

Basics of AI:

AI is a field of computer science that creates systems capable of performing tasks that usually require human intelligence, such as understanding language, recognizing images, reasoning, and making decisions, but using data rather than human experience.

1. Data (the "fuel"): AI learns from information-numbers, pictures, text, speech, videos.

2. Algorithms (the "recipes"): Algorithms are step-by-step instructions that tell the computer how to learn from data and make decisions.

3. Machine Learning (the "learning process"): Machine Learning is how AI finds patterns in data and improves over time, without being explicitly programmed.

4. Models (the "trained brain"): After learning from data, the AI becomes a model—a system that can give predictions or answers.

5. Deep Learning (the "advanced learning"): A type of Machine Learning that works like a digital brain with many layers, able to recognize complex patterns.

6. Natural Language Processing – NLP (the "language skill"): This enables computers to understand and respond to human language, as in ChatGPT.

6a. A Large Language Model (LLM) is a type of Artificial Intelligence designed to understand and generate human language.

7. Generative AI (the "creator"): AI that can create new content-text, images, ideas, plans.

8. Agentic AI (the "doer"): AI that doesn't just generate information-it can take actions, such as scheduling tasks, retrieving data, or completing workflows autonomously (with oversight).

9. Human Oversight (the "safety layer"): AI works best when humans guide, review, and approve decisions.

Types of artificial intelligence:

1. **Weak AI (narrow AI) –** non-sentient machine intelligence, typically focused on a narrow task.

2. **Strong AI / artificial general intelligence (AGI) –** a machine with the ability to apply intelligence to any problem, rather than just one specific problem, typically meaning "at least as smart as a typical human. "

3. **Superintelligence–** artificial intelligence far surpassing that of the brightest and most gifted human minds. Due to recursive self-improvement, superintelligence is expected to be a rapid outcome of the creation of artificial general intelligence.

**Ingredients of AI for Intelligent Action:**

AI works like a smart system made of different specialized abilities, these are

- **LLMs (Large Language Models)** help AI understand and generate human language, like answering questions or summarizing reports.

- **CNNs (Convolutional Neural Networks)** allow AI to recognize patterns in images, like tumours in X-rays or road signs for self-driving cars.

- **RNNs (Recurrent Neural Networks)** help AI understand sequences over time, like vital-sign trends, speech, or stock movements.

- **GANs (Generative Adversarial Networks)** help AI create new, realistic data, like synthetic medical images for training or improving image clarity.

- **Speech Technology** lets AI hear and understand spoken words, enabling voice assistants, clinical dictation, or smart devices.
- **Vision Technology** enables AI to "see" the physical world through cameras and sensors, guiding robots, patient monitoring systems, or navigation.

Figure1: Shows the ingredients of AI:
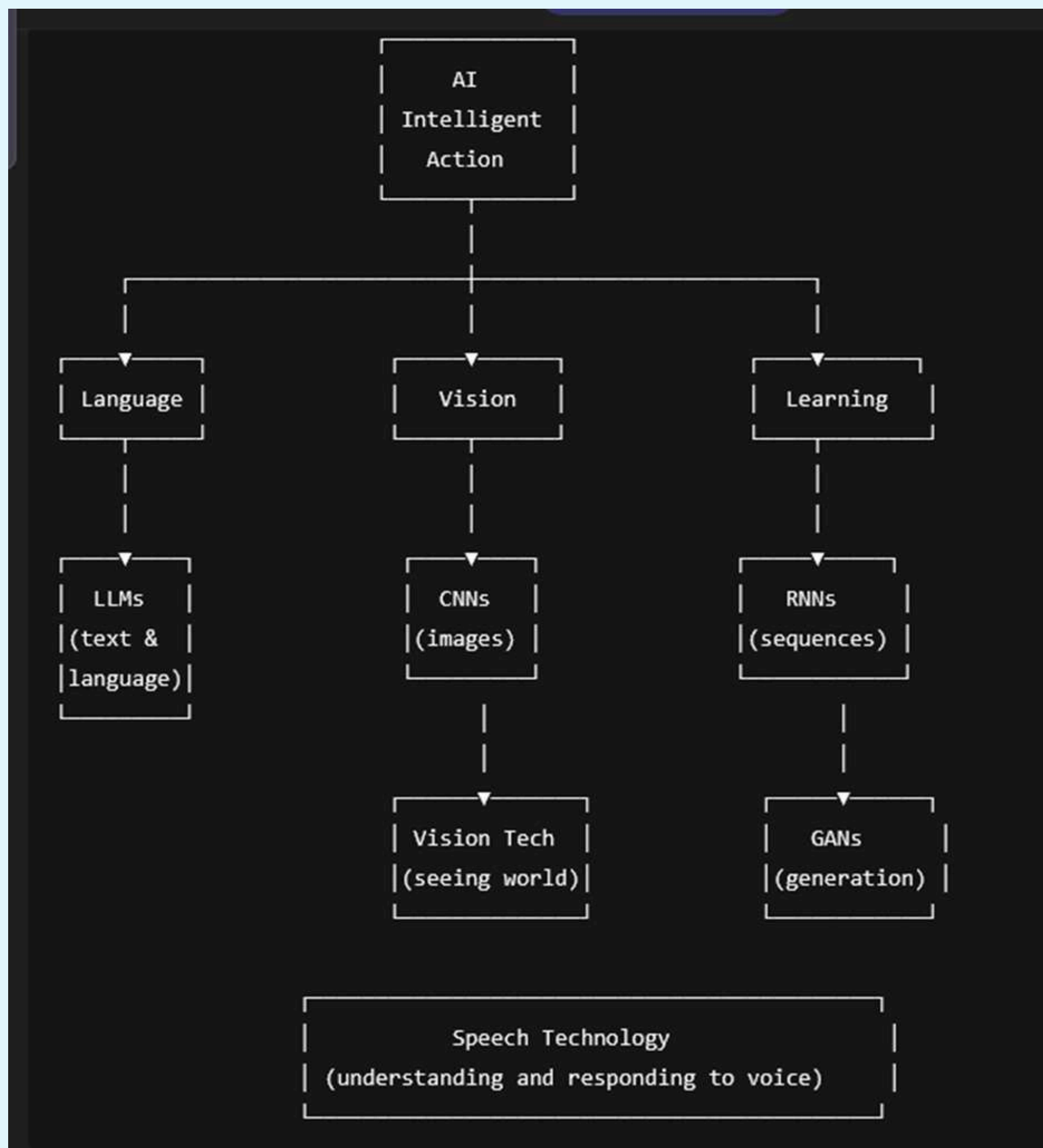
To apply this to nursing, "LLMs (Large Language Models) assist nurses with documentation and clinical queries. CNNs (Convolutional Neural Networks) detect abnormalities in scans and wound images. RNNs (Recurrent Neural Networks) predict patient deterioration from vital trends. GANs (Generative Adversarial Networks) help AI generate new, realistic data, such as synthetic medical images for training or improving image clarity. Speech Technology enables AI to hear and understand spoken words, powering voice assistants, clinical dictation, and smart devices. Vision technology powers surgical robots and fall-detection systems. Together, these AI tools improve diagnosis, reduce errors, support timely intervention, and free nurses for more compassionate patient care."

Figure 2: Shows examples of model types of AI and how they are used in nursing care

AI Model Type	What it learns	Example
Machine Learning models	Patterns in structured data	Predict blood sugar risk from patient data
Neural Networks	Connections between inputs like neurons	Identify tumors in MRI scans
Large Language Models (LLMs)	Meaning and pattern in text	ChatGPT responding to questions
Convolutional Neural Networks (CNNs)	Image and visual patterns	Detect fractures in X-rays
Recurrent Neural Networks (RNNs)	Sequential/time-based data	Monitor patient vitals over time
GANs (Generative Adversarial Networks)	Generate new realistic data	Create synthetic medical images for training
Decision/Neural Trees	Step-by-step logic patterns	Diagnose disease based on symptoms

How AI is Trained:

1. Collect Data: AI needs large amounts of data (images, text, patient records, sensor readings).

2. Clean and Prepare Data: Remove errors, inconsistencies, and irrelevant information. Label data if supervised learning is used.

3. Choose a Model / Algorithm: Select a machine learning model (e.g., neural networks, decision trees, or LLMs).

4. Train the Model: Feed the data into the model. The AI learns patterns, relationships, and features from the data.

5. Validate / Test: Test the model on new, unseen data to check accuracy and reliability.

6. Fine-Tune / Optimize: Adjust model parameters to improve performance. Avoid overfitting or underfitting.

7. Deploy & Monitor: Use AI in real-world applications. Continuously monitor and retrain with new data to maintain accuracy.

Timeline of the evolution of AI:

"AI did not appear suddenly — it grew over many decades. The first spark came when Alan Turing wondered if machines could think like humans. Later, John McCarthy gave this idea a name: Artificial Intelligence. Early researchers such as Marvin Minsky, Herbert Simon, and Allen Newell sought to teach machines to solve problems the way people do.

Progress was slow until breakthroughs in neural networks arrived. Scientists such as Geoffrey Hinton, Yoshua Bengio, and Yann LeCun discovered how machines could learn from large amounts of data. Step by step, their ideas shaped the AI we use today-smart, helpful, and increasingly human-like in understanding."

1. The Idea Begins (1940s–1950s): The dream: Scientists wondered… "Can a machine think?" Alan Turing (1950) proposed the Turing Test—a way to check if a machine can think like a human. (He is often called the "father of AI.")

1956 – Dartmouth Conference: This meeting officially named the field "Artificial Intelligence." This is considered the birth of AI as a science.

2. Early AI Experiments (1950s–1970s) In this period, computers were still weak, but scientists tried simple tasks. Achievements included machines learning to play checkers and chess. Early programs could solve math problems and logic puzzles. The first neural network concepts were introduced. The problem was that computers were too slow, so progress was limited.

3. The "AI Winters" (1970s–1990s): AI faced disappointment because expectations were too high. It slowed down because the computers lacked memory and power. Funding decreased, and people felt AI had failed. This period is called an AI Winter-a time when optimism "froze."

4. Rise of Machine Learning (1990s–2010): AI returned stronger because computers became faster, and data became larger. Breakthroughs were Machine Learning allowed computers to learn from data. AI became good at recognizing handwriting, predicting patterns, and analyzing numbers. The internet created vast amounts of usable data.

Healthcare examples are early decision-support systems, basic predictive models, and automated vital-sign monitoring.

5. Deep Learning Revolution (2010–2020): This is when AI became powerful and visible. The artificial "neural networks" built with many layers, using deep learning and AI, could suddenly recognize faces and understand speech, translate languages, and read medical images. Example: beat world champions in chess and Go. In healthcare, AI began interpreting CT/MRI scans, clinical documentation became semi-automated, and predictive analytics improved.

6. Generative AI Era (2020–Present): AI no longer analyzes-it creates. Examples: ChatGPT-like systems that write, summarize, and answer questions. AI tools that create images, videos, and even simulations, and NLP that understands clinical notes and supports nurses with documentation. This is the era where AI became accessible to everyone-not just engineers.

7. Agentic AI (2024–present): The newest stage, AI that can take actions, not just give information. Examples: AI agents that perform tasks like scheduling, charting, reminding, and summarizing, automation of workflows in hospitals, OR instrument tracking, inventory management, AI that works like a digital colleague (with control and supervision).

"AI and Nursing: Education, Research, Care, and Leadership"

Significant AI fields Application:

1. **Healthcare & Nursing –** diagnostics, patient monitoring, predictive analytics, robotic surgery, personalized treatment.
2. **Education –** adaptive learning, virtual classrooms, grading automation, skill assessment.
3. **Business & Finance –** fraud detection, customer service chatbots, market prediction, risk analysis.
4. **Transportation –** self-driving cars, traffic management, logistics optimization.
5. Manufacturing & Industry – predictive maintenance, robotics, quality control.
6. **Agriculture –** crop monitoring, yield prediction, automated harvesting.
7. **Entertainment & Media –** recommendation systems, content generation, game AI.
8. **Security & Surveillance –** facial recognition, threat detection, cybersecurity.
9. **Environment & Climate –** weather prediction, disaster management, energy optimization.
10. **Research & Development –** data analysis, simulations, drug discovery.

Advantages of AI:

- **AI helps humans do their jobs better—**not by replacing them, but by supporting, speeding up, and strengthening what we already do. AI saves time and automates repetitive tasks. Examples: Documentation assistance, scheduling, inventory checks, and auto-filling reports. Impact: Nurses and clinicians get more time for patient care.
- **Reduces Workload & Stress:** AI takes over the routine, time-consuming tasks. Examples: transcribing notes, monitoring vital signs, flagging abnormal lab results. Impact: Less burnout, fewer delays, smoother workflow.
- **Improves Accuracy:** AI can analyze vast amounts of data and spot subtle patterns that humans may miss. Examples: Early detection of deterioration, predictive alerts (e.g., sepsis, cardiac risk), error checking in medication orders. Impact: Safer and more reliable care.
- **Enhances Decision-Making:** AI provides data-supported insights to help clinical judgment. Examples: Evidence-based recommendations, trend analysis, risk predictions. Impact: Better outcomes and more informed decisions.
- **Personalizes Care:** AI can tailor care plans or recommendations to each patient's unique needs. Examples: Patient-specific education, personalized medication reminders, nutrition, or activity recommendations based on health data. Impact: Improves patient engagement and adherence.

Faster Learning & Education: AI can explain complex topics in simple ways, generate learning content, and offer simulations. Examples: Skill-based virtual simulations, Instant clinical explanations, personalized study guidance. Impact: Better training for student nurses and continuous learning for staff.

- **Helps with Documentation & Communication:** AI can read, write, summarize, and organize text. Examples: Summarizing nursing notes, translating languages, and auto-creating discharge summaries. Impact: Clearer communication and more efficient documentation.

- **Supports Research & Evidence Generation:** AI can scan thousands of articles in minutes and highlight the best evidence. Impact: Faster literature reviews, better quality research, more informed practice, and policymaking.

- **Enhances Safety & Monitoring:** AI systems can constantly watch, listen, and monitor without fatigue. Examples: ICU monitoring, fall risk detection, and early alerts for anomalies. Impact: Improved patient safety.

The Darker Side of AI:

AI is powerful—but like any powerful tool, it has risks.

Understanding these risks helps us use AI wisely, safely, and ethically. "AI is like electricity—powerful and life-changing. But without proper controls, it can cause shock, burns, or harm. The goal is not to fear AI, but to guide it, supervise it, and use it responsibly."

1. Bias and Inequality: AI learns from data; if the data is biased, the AI becomes biased. Examples: If the training data lacks women or minority populations, predictions may be inaccurate for those groups. Clinical risk tools may underpredict severity in some groups—impacting healthcare: unfair treatment decisions, misdiagnoses, or unequal resource allocation.

2. Privacy and Data Misuse: AI requires vast amounts of data, including sensitive health information. Risks: Patient data may be exposed, misused, or accessed by unauthorized parties. Over-collection of data can happen without patients fully understanding. Impact: Breaks trust and violates patient rights.

3. Over-dependence on AI: If humans rely too much on AI, critical thinking can weaken. Example: A nurse may trust an AI risk score without validating it with clinical judgement. Impact: Errors may go unnoticed. Strong human oversight is essential.

4. Misinformation and Hallucinations: AI sometimes generates confident but wrong answers. Example: Wrong clinical interpretation, fabricated references, incorrect medical advice. Impact: Potential harm if the user assumes the output is always accurate.

5. Job Displacement Anxiety: AI can automate tasks. Risk: Fear among nurses/healthcare workers that AI will replace them. Stress, uncertainty, and resistance to adoption. Reality: AI replaces tasks, not nurses-but the fear must be acknowledged.

6. Loss of Human Touch: Healthcare is a human-centered profession. Risk: Too much automation may reduce human connection. Patients may feel that machines are replacing caregivers, leading to a loss of empathy, trust, and therapeutic relationships.

7. Errors Without Accountability: If an AI makes a mistake, who is responsible? Risks: Lack of clear laws, confusion about liability, ethical dilemmas in clinical settings, hospitals, governments, and developers are still defining these rules.

8. Deepfakes and Manipulation: AI can create fake images, voices, and videos. Risks: Fake medical records, false patient reports, identity misuse, and social manipulation. Impact: A serious threat to trust and safety.

9. Security Threats: AI systems can be hacked or manipulated. Example: Altering patient alerts, modifying medication recommendations, and compromising hospital systems. Impact: Patient safety and system integrity at risk.

Checks and Balances:

Globally, AI governance frameworks are evolving. The European Union's Artificial Intelligence Act adopts a risk-based regulatory approach. India's National Strategy for Artificial Intelligence promotes responsible AI in healthcare and education, while the Digital Personal Data Protection Act, 2023 regulates consent, data rights, and penalties for misuse of personal data.

Nursing Perspective:

Nurses play a vital role in preventing the dark side of AI by ensuring ethical use, maintaining patient privacy, avoiding human oversight, and delivering compassionate care and advocacy for safe technologies. AI can support, but nurses safeguard humanity.

Competency Considerations needed for nurses to work with AI:

• Understanding of AI Concepts: Nurses should have a basic understanding of AI concepts, including machine learning, natural language processing, and data mining. This knowledge will help them evaluate the capabilities and limitations of AI tools.

• Data Literacy: Nurses should consider being proficient in data interpretation and analysis. This includes understanding data sources, identifying biases, and evaluating data quality.

• Ethical Considerations: Nurses must be aware of the ethical implications of AI in health care, such as privacy concerns, bias in algorithms, and the potential for job displacement.

• Critical Thinking and Problem-Solving: AI should support human decision-making, not replace it. Nurses need to evaluate AI-generated recommendations and make informed, critical judgments.

• Collaboration and Communication: Nurses often work with data scientists, engineers, and other healthcare professionals to develop and implement AI solutions. Effective communication and collaboration skills are essential.

"AI and Nursing: Education, Research, Care, and Leadership"

AI & Nursing Education:

- **Adaptive Learning Platforms:** Personalized modules based on learner strengths and gaps; AI analyzes performance and recommends targeted content.
- **Simulation & Virtual Reality:** High-fidelity AI-driven VR/AR for clinical decision-making, operative procedures, and emergency scenarios.
- **Automated Skill Assessment:**
- AI evaluates communication, technique, and clinical reasoning (e.g., OSCE scoring).
- Curriculum Modernization: Integrating AI literacy into nursing curricula, teaching data ethics, digital safety, and AI-assisted clinical judgement, and moving from "technology as a tool" to "technology as a partner in care."

How AI can help nursing students:

1. **Personalized Study Plans –** AI checks what students know and creates a study path. (e.g., if a student is weak in cardiac care, it gives more practice in that area).
2. **Virtual Simulations –** AI-driven simulators create lifelike hospital scenarios. (Students can practice CPR, injections, or handling emergencies safely before the real ward.)
3. **Instant Feedback –** AI quizzes and assignments give immediate feedback, showing what's correct and what to improve.
4. **Smart Tutors –** Chatbots and AI tutors answer questions anytime, like a study buddy available 24/7.
5. **Skill Tracking –** AI tracks students' progress and reminds you what to revise before exams or clinical postings.

Benefits for Nursing Students: Builds confidence before clinical placements and exams. Reduces exam anxiety with personalized remediation. Ensures mastery learning (no moving forward until core concepts are understood). Prepares students for real-world clinical variability through adaptive scenarios.

Disadvantage: Over-reliance can lead to a lack of critical and creative thinking.

AI in Nursing Research:

1. Literature Review: AI search engines (like Elicit, Research Rabbit) scan thousands of articles in minutes. Summarize key findings, gaps, and trends.

2. Data Analysis: AI tools analyse large datasets (patient records, survey responses, clinical outcomes). Finds hidden patterns for evidence-based practice.

3. Writing Support: AI assists in structuring research papers, checking grammar, citations, and plagiarism. Suggests better clarity and flow.

4. Predictive Research: Machine learning predicts outcomes (e.g., risk of pressure ulcers, falls, or infections). Helps nurses test new interventions virtually before clinical trials.

5. Qualitative Research: AI transcription & sentiment analysis for interviews/focus groups. Saves time in coding and theme development.

6. Collaboration: AI platforms connect researchers globally, recommend relevant journals, and even suggest funding opportunities.

AI in Clinical Care:

- Smart monitoring systems, predictive analytics, and early warning tools.
- AI-powered diagnostics and decision support for better outcomes.
- Examples of AI in emergency care, critical care, and chronic disease management.

Bedside / Direct Patient Care:

- Smart Monitoring – AI watches vital signs (BP, SpO_2, ECG) and alerts nurses early for deterioration.
- Medication Safety – AI cross-checks prescriptions, allergies, and drug interactions.
- Virtual Assistants – Voice/chatbots remind patients about medication, exercise, or hydration.
- Pain & Emotion Detection – AI analyzes facial expressions/voice to guide pain management.

Ward / Hospital Level:

- Nurse Staffing & Scheduling – AI predicts patient load and suggests optimal nurse-patient ratios.
- Workflow Automation – Auto-documentation, charting, and discharge summaries save nurse time.
- Clinical Decision Support (CDS) – AI gives evidence-based recommendations for wound care, infection control, IV therapy, etc.
- Simulation Training – AI-driven scenarios (CPR, emergencies) keep nurses practice-ready.

Community & Public Health:

- mHealth Apps with AI – Reminders for vaccination, antenatal check-ups, TB/HIV adherence.
- Predictive Analytics – AI forecasts outbreaks (dengue, flu) from community health data.
- Tele-nursing with AI Chatbots – 24/7 health guidance for rural/remote patients.
- Home Care Support – Wearables + AI alert nurses/families if an elderly patient falls or misses meds.

Care to be taken in clinical settings with AI:

- Clinical safety: use AI as advice; show rules/explanations; default to escalation.
- Data privacy: minimal data collection, on-device encryption, role-based access.
- Bias & language: evaluate in local languages; test on real cases before scale.
- Uptime plan: offline fallbacks, power cuts (UPS/power banks), easy paper backup.
- Training: 1–2 local champions; simple SOPs and laminated “what to do when AI fails.”

Boardroom: AI in Nursing Leadership:

AI supports leaders in driving healthcare innovation and policy.

a. Data-Driven Decision-Making: AI tools analyse staffing, patient outcomes, and resource use. Example: Predicting staffing shortages and reallocating resources.

b. Strategic Planning & Policy: AI supports population health management and forecasting. Helps nurse leaders advocate for policy changes with evidence.

c. Ethical & Professional Leadership: Nurse leaders ensure ethical AI adoption (privacy, bias, patient dignity). They shape guidelines for safe and human-centered AI integration. Implication: Nurse leaders become change agents, guiding healthcare into the AI-driven future.

Ethics, Privacy, and Professional Responsibility with AI:

- Data privacy, consent, and patient rights in AI healthcare tools.
- Addressing bias in AI algorithms and ensuring equitable care.
- Nursing's role in upholding ethical AI use.

Future of Nursing in the AI Era:

New roles for nurses: AI interpreters, digital health advocates, data stewards.

Continuous learning and adaptability in tech-integrated care.

Vision of a future where competent care + human touch co-exists seamlessly.

Conclusion: AI and nursing in India are still in their infancy. Each of us, as a student nurse, researcher, nurse, and nurse leader, should be informed and involved in AI's contributions to nursing and our patients. We owe this to our patients and population, from the classroom to research, the bedside to the boardroom; we need to be involved in the planning, implementation, and evaluation of AI. As quoted by W. Edwards Deming, "If you can't describe what you are doing as a process, you don't know what you're doing." "Imagine education as the mind, research as the eyes, care as the hands, and leadership as the voice of nursing. What happens when AI becomes the pulse running through them all-does it quicken the rhythm of healing, or risk drowning out the heartbeat?" "AI is like electricity-powerful and life-changing. But without proper controls, it can cause shock, burns, or harm. The goal is not to fear AI, but to guide it, supervise it, and use it responsibly." Instead of questioning whether we belong at the table, we need to be collaborators with the team seated there, for we are the heart of the healthcare delivery system.

Reference:

1. J.A. Pepito, R. Locsin / International Journal of Nursing Sciences 6 (2019) 106e110

2. Turing AM. Computing machinery and intelligence. Mind. 1950;59(236):433–460. doi:10.1093/mind/LIX.236.433

3. McCarthy J, Minsky M, Rochester N, Shannon C. A proposal for the Dartmouth summer research project on artificial intelligence. Hanover (NH): Dartmouth College; 1956.

4. Russell S, Norvig P. Artificial intelligence: A modern approach. 4th ed. Harlow: Pearson; 2021.

5. Haenlein M, Kaplan A. A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. Calif Manage Rev. 2019;61(4):5–14. doi:10.1177/0008125619864925

6. IBM. History of artificial intelligence [Internet]. Armonk (NY): IBM Research; 2023 [cited 2025 Jan 10]. Available from: https://www.ibm.com/think/topics/history-of-artificial-intelligence.

7. LeCun Y, Bengio Y, Hinton G. Deep learning. Nature. 2015;521(7553):436–444. doi:10.1038/nature14539.

8. Vaswani A, Shazeer N, Parmar N, Uszkoreit J, Jones L, Gomez AN, et al. Attention is all you need. Adv Neural Inf Process Syst. 2017;30:5998–6008.

9. Brown TB, Mann B, Ryder N, Subbiah M, Kaplan J, Dhariwal P, et al. Language models are few-shot learners. Adv Neural Inf Process Syst. 2020;33:1877–1901.

10. LeCun Y, Bottou L, Bengio Y, Haffner P. Gradient-based learning applied to document recognition. Proc IEEE. 1998;86(11):2278–2324. doi:10.1109/5.726791.

11. Hochreiter S, Schmidhuber J. Long short-term memory. Neural Comput. 1997;9(8):1735–1780. doi:10.1162/neco.1997.9.8.1735

12. Goodfellow I, Pouget-Abadie J, Mirza M, Xu B, Warde-Farley D, Ozair S, et al. Generative adversarial nets. Adv Neural Inf Process Syst. 2014;27:2672–2680.

13. Goodfellow I, Bengio Y, Courville A. Deep learning. Cambridge (MA): MIT Press; 2016.

14. Topol EJ. Deep medicine: How artificial intelligence can make healthcare human again. New York: Basic Books; 2019.

15. Al Khatib I, Ndiaye M. Examining the role of artificial intelligence in changing the role of nurses in patient care: A systematic review. JMIR Nurs. 2025;8(1):e63335. doi:10.2196/63335

16. Artificial intelligence in nursing practice: Nurses' perspectives on opportunities, challenges, and ethical implications. BMC Nurs. 2025;24:75. doi:10.1186/s12912-025-03775-6

17. Tiase VL, Hull W, McFarland M, Sward K, Delaney C. Using data science to advance nursing practice. Nurs Outlook. 2020;68(1):44–51. doi:10.1016/j.outlook.2019.10.001

18. Warren JJ. Nursing informatics: A foundation for quality healthcare. Nurs Clin North Am. 2015;50(2):233–245. doi:10.1016/j.cnur.2015.02.001

19. Rossetti SC, Keenan G, Balestra M, McGrow K. Preparing nurses for artificial intelligence in healthcare: Education, leadership, and ethical practice. J Nurs Adm. 2025;55(2):75–82.

20. Floridi L, Cowls J, Beltrametti M, Chatila R, Chazerand P, Dignum V, et al. AI4People—An ethical framework for a good AI society. Minds Mach. 2018;28(4):689–707. doi:10.1007/s11023-018-9482-5

21.Mittelstadt BD, Allo P, Taddeo M, Wachter S, Floridi L. The ethics of algorithms: Mapping the debate. Big Data Soc. 2016;3(2):1–21. doi:10.1177/2053951716679679

22. European Union. Regulation (EU) 2024/… laying down harmonised rules on artificial intelligence (Artificial Intelligence Act). Off J Eur Union. 2024.

23. NITI Aayog. National strategy for artificial intelligence: #AIForAll. New Delhi: Government of India; 2018.

24. Government of India. The Digital Personal Data Protection Act, 2023. New Delhi: Ministry of Law and Justice, 2023.

"Innovations in Nursing Education with Artificial Intelligence: Global Scenario"

Dr. Sharadha Ramesh,

Dean- Faculty of Nursing, VMRF(DU), Salem, Tamilnadu, India

Introduction: AI typically refers to the ability of computers to independently convert data into knowledge to guide decisions or autonomous actions including risk prediction algorithms, robots, and speech recognition—all of which augment nursing practice and are on a fast track to changing healthcare as a whole. In healthcare, AI frequently refers to computer software programs designed to interpret data (for example, patient records, administrative claims, medical imaging, and data from mobile devices), learn from that data, and inform clinical and operational decision-making. Nursing AI tools include clinical decision support, mobile health and sensor-based technologies, and voice assistants and robotics.

AI definitions:

According to Merriam-Webster, Artificial Intelligence (AI) is defined as a machine's capacity to imitate intelligent human behaviours, such as reasoning and problem-solving.

What is the heart of AI in total?

- Machine learning, deep learning, and neural networks are at the heart of Artificial Intelligence. Machine learning, which also includes natural language processing, was the first term coined for autonomous computer learning, with deep learning and neural networks coming later as more advanced methods.

Terms	Definition	Application examples
Machine learning	Machine learning is a type of AI that uses algorithms to analyse raw data and develop computer instructions to achieve objectives such as making predictions, recognizing speeches, translating text, and playing games.	• Disease (e.g., diabetes, heart disease) pre- diction • Early sepsis detection • Automated diagnosis from medical images (e.g., tumour recognition and staging) • Drug discovery • Disease outbreak detection • Personalized healthcare through genomics (e.g., drug therapy)
Deep learning	Deep learning is a subfield of machine learning. A deep learning model is designed to reach the same conclusions as a traditional machine learning algorithm but does so with much less human input. To achieve this, deep learning applications use a layered structure of model elements called an artificial neural network.	
Neural networks	Neural networks are composed of algorithms modelled after human thought processes. These networks are used to recognize patterns from large amounts of data, whether it's alpha-numeric or images.	Diagnosis confirmation • Clinical ontology /terminology development • Automated content/qualitative analysis • Use of Twitter data to detect flu outbreaks
Natural language processing	This machine learning field focuses on developing computer algorithms that process and analyse unstructured text or speech data.	

Nurses and AI: AI incorporated in Nursing Education

There is no single nurse to have used AI. Nurses at New Haven, Yale were the early adopters of the Rothman Index an AI powered predictive tool to identify at risk patients.

Machine learning:

- The goal of the machine learning tool, and the data it has access to, is determined by its developer, but how the program uses the data isn't known. This inherent uncertainty is called the "black box." a machine learning tool's function and use are only as good as its data sources. This is where nurses are needed. Nurses with a boots-on-the-ground perspective understand patient care and the information that's required to make informed clinical decisions. Nurse input improves the applicability and accuracy of machine learning tools.

For example, Wang and colleagues developed a tool to predict fall severity to assist in preventing injury in high-risk patients. This algorithm used data points such as age, sex, race, bone density, procedural data, and diagnoses to develop a risk score for the likelihood of having a fall with severe injury. The researchers used retrospective data to train the model, allowing it to learn and create an accurate prediction score. Next phases of research require nurses to evaluate the tool's practical use. This example of machine learning shows the potential for creating risk prediction scores that wouldn't be feasible with manual calculations or EHR-integrated flowsheets.

For example, the Super Alarm, an application developed by Hu, uses patterns of co-occurrences of individual alarms (such as arrythmia alerts and hemodynamic monitoring) to predict impending cardiopulmonary arrests. Hu demonstrated the ability to achieve 90% sensitivity in predicting when critical care patients would need resuscitation. This machine learning application is relevant to nursing because in addition to improving patient outcomes, it also reduces alert fatigue by combining alarm signals into less frequent, but significant usable information.

Deep learning:

Deep learning, a subfield of machine learning, advances nursing using neural networks for advanced pattern recognition, which has helped machine learning extend to new sources of data, including speech recognition and image analysis. AI can be used to tailor treatments precisely to patients' specific genes, lifestyles, and treatment preferences.

Deep learning applications can help nurses identify at-risk patients who would benefit from clinical interventions to prevent adverse health events, such as sepsis or hospital readmission.

For example, Duke University researchers Theiling and colleagues created Sepsis Watch, which is trained via deep learning to analyse over 32 million data points to create a patient's risk for developing sepsis. If the findings call for action, the hospital's rapid response team is automatically alerted and guided through the first 3 hours of care administration.

Imaging advances using deep learning include detection (such as early or automated detection of neurologic abnormalities or cancer), characterization (staging or diagnosis), and monitoring (tumour changes over time). Many of these tools are as accurate as (or sometimes even more accurate than) humans and have potential for growth and increased adoption.

Natural Language Processing (NLP):

- NLP is the analysis of EHR text data, rather than numbers or other countable elements. It can be used alone or in conjunction with machine learning methods and may contribute to other AI areas; for example, sentiment analysis could be used to determine how positive or negative a clinician or patient feels about a prognosis. Of all AI applications, NLP usually is cited as being the most difficult to adopt because of a lack of formal data intake and reporting. However, several promising applications currently in use affect patient care and health outcomes. In nursing, a valuable source of text data comes from nursing notes, which frequently are rich with clinical information.

- A wide variety of applications have been developed using nursing notes, including predicting emergency department patient disposition (Sterling and colleagues), uncovering patient financial barriers (Skaldic and colleagues), and predicting falls (Nakatani and colleagues).

- NLP also may refer to voice recognition, such as that found in Siri or Alexa. In healthcare, voice recognition may help with note writing, information retrieval, and chart navigation. Speech recognition programs convert language to text, but NLP advancement may provide more sophisticated options.

Applications in nursing education- Key Applications of AI in Nursing Education:

1. **Simulation and Virtual Reality Learning:** AI-driven simulations allow students to practice complex clinical scenarios in a controlled environment, improving confidence and clinical decision-making skills.

a. AI-Enhanced High-Fidelity Mannequins: Robots that interact with students more realistically than traditional mannequins, responding to interventions with lifelike physiological changes.

b. Virtual Reality (VR) and Augmented Reality (AR): Immersive environments where students practice rare or dangerous scenarios safely.

c. Clinical Scenario Simulations: AI-powered virtual patients that adapt to student decisions, providing realistic medical emergencies and complex case management practice.

d. AI-powered chatbots: These tools provide educational assistance, support simulations, and facilitate assessment and evaluation.

e. Virtual patients: Students can interact with virtual patients to practice patient assessment, communication and care planning.

f. Clinical decision support: Students can learn to use AI tools that provide real-time suggestions, identify patient risks (like fall risk), and help develop nursing diagnoses, mirroring how AI is used in clinical practice.

g. Adaptive learning platforms: These platforms personalize the learning experience by tailoring content and pace to individual student needs.

These technologies enable students to experience situations difficult to reproduce in traditional settings, such as natural disasters, pandemic responses, or cultural healthcare challenges.

2. Personalized Learning and AI Tutors:

AI is enabling "precision education" - analogous to precision medicine - through:

a. Intelligent Tutoring Systems: AI tutors like Khan Migo provide individualized instruction adapted to each student's learning pace and style.

b. Instant Feedback: Real-time assessment of clinical documentation, medication calculations, and patient interview techniques.

c. Adaptive Learning Pathways: Systems that identify knowledge gaps and adjust content delivery accordingly.

d. 24/7 Learning Support: AI chatbots available round-the-clock to answer questions and guide learning.

e. Wearable technology: AI-powered wearables can be used to train students, for example, by analysing the accuracy of techniques like hand washing.

These tools significantly augment educators' capacity to provide personalized attention to each student.

3. Chatbots and Conversational AI

Chatbots are being implemented for:

a. Patient-Care Simulation: Students practice therapeutic communication and assessment interviews.

b. Critical Thinking Enhancement: Scenario-based conversations that challenge clinical reasoning.

c. Interprofessional Communication Training: AI-powered dialogues simulating interactions with physicians, pharmacists, and other healthcare team members.

d. Telehealth Preparation: Training for remote patient care and virtual consultations.

Research shows chatbots improve communication skills, empathy, clinical reasoning, and student satisfaction.

4. Clinical Decision Support Tools:

Students learn to use AI-powered systems that:

- Generate nursing diagnoses based on patient data.
- Calculate patient fall risk predictions.
- Develop decision trees for preventing infections (e.g., catheter-associated UTIs).
- Provide data-driven treatment recommendations.
- Analyse large volumes of patient information rapidly.

These tools prepare students for AI-enhanced clinical environments they'll encounter in practice.

5. Wearable Technology Integration:

Emerging frontier combining AI with wearable devices for:

- Real-time physiological monitoring during simulations.
- Skills assessment through motion tracking and biosensor feedback.
- Immersive hands-on training in controlled environments.
- Bridging theory-practice gaps through personalized learning experiences.

Wearables represent a key pathway for leveraging AI in nursing education, particularly when integrated with simulation laboratories.

Benefits of AI in nursing education:

1. **Enhances clinical judgment:** AI tools can help students develop better clinical judgment by presenting them with data-driven insights and decision trees.
2. **Bridges theory and practice**: AI simulations and tools help bridge the gap between theoretical knowledge and practical application.
3. **Personalized learning**: AI can adapt educational content to meet the specific needs and pace of each student.
4. **Improves student engagement:** Interactive AI tools and games can increase student satisfaction and engagement.

Challenges and considerations

Data privacy and security: Protecting sensitive student and patient data is a major concern, requiring strict policies and encryption.

Ethical dilemmas: Educators must guide students on ethical issues related to AI, such as data ownership and patient autonomy, while also ensuring technology is used to support, not replace, human care.

Over-reliance on technology: There is a risk that students may become too dependent on AI, potentially diminishing their critical thinking and problem-solving skills. AI should be a complementary tool, not a substitute for traditional teaching methods.

Cultural and institutional resistance: Integrating new technology can face resistance from faculty and institutions.

Need for AI literacy: Both students and educators need training to effectively use and understand AI tools, including prompt engineering and the limitations of AI.

Major Opportunities

Enhanced Clinical Judgment Development

AI enables students to:

- Leverage data-driven insights for informed decision-making.
- Interpret complex data sets and predictive models.
- Apply AI-generated insights directly to patient care scenarios.
- Improve learning outcomes and academic performance.

Curriculum Innovation

- **Adaptive Curriculum Design:** AI analyses student performance data to identify areas needing curriculum enhancement.
- **Evidence-Based Teaching:** Data-driven insights into which pedagogical approaches work best.
- **Competency Assessment:** Objective evaluation of clinical skills and knowledge acquisition.
- **Global Collaboration:** AI facilitates cross-border educational partnerships and resource sharing.

Addressing Healthcare Challenges

AI in nursing education helps prepare nurses for:

- Technology-driven healthcare systems.
- Aging populations and chronic disease management.
- Healthcare workforce shortages.
- Pandemic preparedness and public health emergencies.

Significant Challenges

1. Ethical and Privacy Concerns

Critical Issues:

- Data Privacy: Managing sensitive student and patient information.

Algorithmic Bias: AI systems trained predominantly on data from specific populations may not perform equally across diverse patient groups.

- **Health Disparities:** Risk of perpetuating or exacerbating existing inequalities.
- **Autonomy:** Concerns about AI replacing human judgment and nursing's caring essence.

Action Required: Institutions must integrate cyber ethics principles (autonomy, beneficence, nonmaleficence, justice, explainability) into curricula.

2. Faculty Preparedness Gap

Major Barrier: Many nurse educators remain unfamiliar with AI, showing limited understanding of its tools and capabilities.

Needs:

- **AI Literacy Development:** Educators must develop competencies to understand, interact with, and translate AI into education.
- **Specialized Training:** Ongoing professional development in AI technologies.
- **Institutional Support:** Universities often lack policies supporting structured AI incorporation.

3. Overreliance on Technology

Concerns:

- Students may neglect critical thinking, relationship building, and communication skills**.**
- **Academic Integrity:** AI tools like ChatGPT can facilitate plagiarism.
- Risk of diminishing face-to-face human interactions central to nursing.

Solutions: Establishing clear acceptable use policies, promoting ethics and original thinking, and highlighting AI's limitations.

4. Cultural and Contextual Barriers

- **Cultural Resistance:** Varying acceptance levels across different societies.
- **Infrastructure Gaps:** Disparities in technological resources between institutions.
- **Bias in AI Models:** Limited data from Indigenous and minority populations.
- **Language Barriers:** Most AI tools optimized for English-speaking contexts.

5. Cost and Resource Constraints

- High implementation costs for advanced AI systems.
- Need for technical infrastructure and IT support.
- Training expenses for faculty development.
- Ongoing maintenance and updates.

AI in Nursing Education - Global Scenario

Artificial Intelligence is revolutionizing nursing education worldwide, transforming how future nurses are trained, assessed, and prepared for technology-driven healthcare systems. Here's a comprehensive overview of the global landscape:

Current State and Adoption & Global Perceptions and Acceptance:

Recent cross-national research involving nursing educators from Saudi Arabia, the Philippines, India, and Egypt reveal balanced optimism about AI integration. Educators recognize AI's potential benefits (mean score: 4.38/6.0) while remaining aware of associated risks (mean score: 4.18/6.0). Trust in AI stands at moderate levels (4.00/6.0), with significant variations across cultures and regions. Key Finding: While perceived benefits remain consistent across countries, there are significant differences in risk perception, exposure levels, and cultural attitudes toward AI implementation.

Regional Variations:

India shows the highest adoption rates and positive perceptions across all AI metrics, while Saudi Arabia demonstrates more conservative attitudes.

The Philippines and Egypt fall in the middle range, reflecting moderate acceptance and implementation levels. These variations stem from differences in technological infrastructure, educational policies, and cultural attitudes toward technology.

Global Initiatives and Leadership @United States

American Association of Colleges of Nursing (AACN):

- Hosted the 2025 Thought Leaders Assembly focused on "Examining the Potential of AI to Transform Nursing Education".
- Provides webinars, conference sessions, tools, and research on AI trends.
- Developing strategic frameworks for AI integration.

American Nurses Association (ANA):

- Published position paper on ethical use of AI in nursing practice (2022).
- Emphasizes transparency, bias elimination, preventing health disparities, and protecting patient privacy.
- Stresses that AI must not compromise nursing's caring and compassionate essence.

National League for Nursing (NLN):

Released AI Vision Series (2025).

Advocates for diverse strategies to incorporate generative AI literacy into nursing curricula.

Nursing and Artificial Intelligence Leadership (NAIL) Collaborative:

Develops strategies for nurses to take leadership roles in AI development.

Focuses on improving nurses' understanding of the data-AI relationship.

International Developments:

Cross-National Research: Studies comparing AI integration in Saudi Arabia, Philippines, Egypt, India, Bangladesh, and other Asian countries reveal diverse implementation patterns and cultural considerations.

European Initiatives: Focus on ethical frameworks and data protection compliance (GDPR considerations).

Middle East and Gulf Countries: Comparing AI-based nursing curricula, exploring implementation strategies, and identifying gaps.

Specific AI Tools and Technologies on Educational AI Platforms:

- **ChatGPT and Generative AI:** Used for research support, literature reviews, and writing assistance.
- **Nursify AI:** Specialized AI tool trained on nursing textbooks, evidence-based practices, and NCLEX standards.
- **Adaptive Learning Systems:** Platforms that customize content based on individual student performance.
- **Virtual Patient Simulators:** AI-driven patient avatars for clinical practice.

Clinical Training Technologies:

- AI-Enhanced Robotics: Realistic patient simulators with responsive physiology.
- Smart Wearables: Devices tracking student performance during skills practice.
- Voice Assistants: AI-powered systems for hands-free information access during simulation.
- Mobile Health Applications: AI-driven apps for clinical decision support training.

Future Directions (2025 and beyond):

Emerging Trends:

AI Co-Pilots for Educators: Tools that assist faculty in curriculum design, assessment, and student support.

Multimodal AI Integration: Combining text, voice, image, and sensor data for comprehensive learning experiences.

Predictive Analytics: Identifying at-risk students early and providing targeted interventions.

Global Collaborative Learning: AI facilitating international student partnerships and cultural exchange.

Continuous Competency Assessment: Real-time tracking of skill development throughout nursing careers.

Research Priorities:

- Effectiveness studies comparing AI-enhanced vs. traditional education methods.
- Long-term impact on patient outcomes and nursing practice quality.
- Cultural adaptation frameworks for diverse global contexts.
- Ethical guidelines for AI in healthcare education.
- Faculty development best practices.

Policy Development

Needed Actions:

- Institutional AI policies and guidelines.
- Accreditation standards incorporating AI competencies.
- Ethical frameworks specific to nursing education.
- International collaboration on AI standards.
- Student data protection regulations.

Recommendations for Implementation:

For Educational Institutions

1. **Develop Clear AI Policies:** Establish guidelines for acceptable use, addressing academic integrity and ethical concerns.
2. **Invest in Faculty Development:** Provide comprehensive AI literacy training for educators.
3. **Start Small:** Pilot AI technologies in specific courses before widespread implementation.
4. **Ensure Equity:** Address access disparities to prevent creating educational divides.
5. **Maintain Human Element:** Use AI to enhance, not replace, human teaching and caring relationships.

For Nurse Educators:

Develop AI Literacy: Understand AI capabilities, limitations, and appropriate applications.

Integrate Ethically: Teach students responsible AI use and critical evaluation of AI outputs.

Balance Technology with Humanity: Preserve nursing's core values of compassion and patient-centred care.

Stay Current: Engage in continuous learning about evolving AI technologies.

Collaborate: Share best practices and learn from colleagues' experiences.

For Students:

1. Embrace Technology Responsibly: Learn to use AI as a tool, not a replacement for learning.
2. Maintain Critical Thinking: Question AI outputs and verify information.
3. Understand Limitations: Recognize what AI can and cannot do.
4. Develop AI Competencies: Prepare for technology-rich clinical environments.
5. Uphold Ethics: Use AI in ways consistent with nursing professional standards.

Conclusion:

AI in nursing education represents a transformative opportunity with both tremendous potential and significant challenges. The global scenario reveals:

- **Growing Adoption:** AI integration is accelerating across all regions, though at different paces.
- **Proven Benefits:** Evidence shows AI enhances learning outcomes, clinical judgment, and skill development.
- **Persistent Challenges:** Ethical concerns, faculty preparedness, bias, and cultural factors remain barriers.
- **Need for Balance:** Success requires integrating technology while preserving nursing's humanistic core.
- **Cultural Sensitivity:** Implementation must account for diverse contexts and values.

The future of nursing education will inevitably involve AI, but the **human element of nursing care remains irreplaceable.** The goal is not to replace nurse educators or diminish the importance of human connection, but to leverage AI as a powerful tool that enhances teaching, personalizes learning, and better prepares nurses for the technology-driven healthcare systems they will serve.

Moving Forward: The nursing profession must take an active leadership role in shaping AI **development and implementation, ensuring these technologies align with nursing values, promote equity, and ultimately improve patient care worldwide.**

Conclusion:

Nurses must ensure AI does not compromise the caring, compassion, and human relationships that are central to nursing. The Nursing and Artificial Intelligence Leadership (NAIL) Collaborative is another group that has developed strategies for nurses to take leadership roles in shaping the use of AI in health systems and nursing practice. Priorities outlined by NAIL include improving nurses' understanding of the relationship between the data they generate and the AI technologies they use. Investment in AI is increasing as healthcare organizations seek to improve care and lower costs.

Shaping the future of care:

Nurses will be the key to helping organizations implement and adapt to AI technology transformations as they participate in the development and evaluation of new applications that will shape the future of patient care.

Key Resources for Further Exploration:
- <u>AACN AI in Nursing Education Hub</u>
- <u>JMIR Nursing AI Research</u>
- <u>NIH/PMC AI in Nursing Education Collection</u>
- National League for Nursing AI Vision Statement
- American Nurses Association Position Paper on Ethical AI Use

Key Takeaways from the Transformative Potential:

AI accelerates adoption with proven benefits (outcomes/judgment) but faces ethics/faculty/bias hurdles—balance tech with humanism.

"Using ChatGPT in Nursing"

Mr. David Puller,
Librarian, Lone star college—north Harris
Houston, Texas, USA

Evaluating Information:

- Authority
- Currency
- Objectivity
- Verifiability

Erwin Knoll's Law of Media Accuracy- "Everything you read in the newspapers is absolutely true except for the rare story of which you happen to have first-hand knowledge."

Two Other Major Problems with AI and Healthcare:

- Keeping patient information private.
- Accountability: who is responsible when an AI fails? If a nurse acts upon bad instructions from ChatGPT, is the nurse responsible?

Peng et al. "ChatGPT integrates into the nursing workflow to improve work efficiency. Its natural language processing technology can efficiently parse unstructured text in electronic medical records, automatically extract key information such as patient history, medication records, and laboratory results, and generate structured summaries...."

Suggestions for Nursing Students from ChatGPT Itself:

- Explore "what if" scenarios for different treatments and outcomes (brainstorming, not research).
- Get feedback for SOAP notes and other documentation for clarity, conciseness, and professionalism.
- Role-play patient interactions, especially sensitive topics.

Writing with AI Is Hazardous:
- Writing forces you to think.
- When you let AI do your writing, you can't be sure you understand the results.
- Dr. James Biehl Ohio Wesleyan University.

Suggestions for Nursing Professors from ChatGPT Itself:
- Generate scenarios for students to consider.
- Develop discussion questions.
- Generate branching scenarios and visual flowcharts for critical thinking.

Recommendations:
- The best uses for ChatGPT are to:
- Simulate interactions with patients.
- Improve communication skills.
- Model dialogues.
- Develop ethical scenarios and case studies.

"Artificial Intelligence in Simulation-Based Nursing Education

Dr. Rajrani Sharma, Professor, Lone Star College of Nursing, Texas, USA.

If you are reading this, you might be curious about artificial intelligence (AI) in simulation but unsure where to begin. Maybe you are thinking, "This sounds great, but is it really practical for someone like me?" The answer is a resounding yes.

As healthcare systems worldwide confront increasing complexity, nursing education must adopt innovative, evidence-based strategies to prepare graduates for safe, effective, and culturally responsive practice. Simulation-based education has become a globally endorsed pedagogical approach for developing clinical competence while protecting patient safety.

International research demonstrates that AI-supported simulation improves clinical reasoning, decision-making, learner confidence, and knowledge retention among nursing students and practicing clinicians across undergraduate, graduate, and continuing education programs.

From a faculty perspective, AI offers powerful tools to support learner-centered education while maintaining academic rigor.

Importantly, AI does not replace the role of the nurse educator; rather, it enhances faculty capacity by reducing administrative burden and allowing educators to focus on mentorship, professional judgment, and reflective learning.

Globally, organizations such as the World Health Organization, the International Council of Nurses, and leading academic institutions emphasize the need for innovative educational models that strengthen clinical judgment, interprofessional collaboration, and workforce readiness.

This presentation highlights how AI can be thoughtfully and responsibly implemented to enhance teaching effectiveness, support faculty development, and prepare nurses for increasingly complex global healthcare environments.

Ultimately, the strategic use of AI in simulation is not about replacing human expertise. AI will make mistakes. That's why your expertise remains essential. Always review AI-generated content, validate clinical accuracy, and use your judgment. Think of AI as an intern—capable and helpful but requiring supervision.

Research from North America, Europe, Asia, and Australia indicates that AI-supported simulation improves learner confidence, supports individualized learning pathways, and enhances retention of clinical knowledge and skills. Importantly, AI does not replace educators.

AI-driven simulation offers scalable solutions that can bridge gaps in clinical placement availability, support remote and international collaboration, and promote standardized competency development across diverse learning environments.

AI in simulation is not about technology for technology's sake. It is about leveraging innovation to educate safer nurses, strengthen clinical judgment, and prepare a globally competent nursing workforce capable of meeting the complex demands of modern healthcare."

"Opportunities for the Latest Review of Literature (ROL) in Nursing Research with Artificial Intelligence"

Dr Sheela Upendra, Deputy Director and Professor, Symbiosis College of Nursing, Symbiosis International (Deemed University) sheelaupendra2013@gmail.com

Abstract:

The rapid integration of Artificial Intelligence (AI) into healthcare has significantly influenced nursing practice, education, and research. Nursing research, in particular, has witnessed a paradigm shift in how literature is identified, analyzed, synthesized, and applied to evidence-based practice. The Review of Literature (ROL), a foundational component of nursing research, is evolving with the use of AI-driven tools such as machine learning algorithms, natural language processing, and predictive analytics. These technologies enhance efficiency, accuracy, and depth of literature reviews, enabling nurse researchers to manage large datasets, identify research gaps, and generate novel insights. This manuscript explores the opportunities offered by the latest ROL approaches in nursing research through AI integration. It discusses AI applications in literature search, screening, synthesis, trend analysis, ethical considerations, and future research directions. Emphasizing both benefits and challenges, this paper highlights how AI can strengthen the rigor and relevance of nursing research while supporting innovation and evidence-based decision-making.

Keywords: Artificial Intelligence, Nursing Research, Review of Literature, Evidence-Based Practice, Machine Learning.

Introduction:

Nursing research plays a pivotal role in advancing healthcare quality, patient safety, and professional practice. At the core of any research endeavor lies the Review of Literature (ROL), which establishes theoretical grounding, identifies research gaps, and prevents duplication of studies. Traditionally, ROL has been a time-consuming, manual, and cognitively demanding

process requiring extensive database searches, screening, appraisal, and synthesis of scholarly evidence.(Patrician et al., 2024)

With the exponential growth of scientific publications, nurse researchers face challenges in managing vast volumes of literature. Artificial Intelligence (AI) has emerged as a transformative solution, offering innovative methods to streamline and enhance the ROL process. AI technologies are capable of processing large datasets, recognizing patterns, and generating insights that surpass traditional manual methods.(Rezaei, 2025)

The integration of AI into nursing research aligns with the broader digital transformation of healthcare.(Wei et al., 2025) This manuscript examines the opportunities presented by the latest AI-enabled ROL methods, emphasizing their relevance to nursing research, education, and practice. By leveraging AI, nurse researchers can improve research efficiency, quality, and impact.

Review of Literature in Nursing Research:

The Review of Literature is a systematic and critical examination of existing scholarly work relevant to a research topic. In nursing research, ROL serves multiple purposes like establishing a theoretical and conceptual framework, Identifying gaps and inconsistencies in existing knowledge, Supporting research problem formulation, Guiding methodology selection and enhancing evidence-based nursing practice.

A high-quality ROL requires comprehensive searching, critical appraisal, and synthesis of findings (Shaheen et al., 2023).However, conventional approaches often struggle with issues such as publication overload, reviewer bias, and limited scope. AI introduces advanced capabilities that can address these limitations effectively.

Artificial Intelligence in Healthcare and Nursing:

Artificial Intelligence refers to computer systems designed to perform tasks that typically require human intelligence, such as learning, reasoning, and decision-making. In healthcare, AI applications include clinical decision support, diagnostics, patient monitoring, and predictive analytics(Khosravi et al., 2024). In nursing, AI contributes to clinical decision-making support, Patient outcome prediction, Workflow optimization, personalized care planning and research data analysis. AI's growing role in nursing research extends beyond data analysis to knowledge generation and literature management, making it a valuable asset in conducting advanced ROLs.

AI-Driven Tools for Literature Search and Retrieval:

One of the most significant opportunities AI offers in ROL is enhancing literature search and retrieval(Kovari, 2025). Traditional keyword-based searches are often limited by researcher expertise and database constraints. AI-powered search engines use natural language

processing (NLP) and semantic analysis to understand contextual meaning. Key opportunities include intelligent search algorithms that retrieve highly relevant articles, automated identification of synonyms and related concepts, Cross-database integration and real-time updates and education in missed or irrelevant studies (da Costa et al., 2024).These tools allow nurse researchers to conduct broader and more precise literature searches, improving the comprehensiveness of ROLs.

AI in Screening and Selection of Literature:

Screening large volumes of articles for inclusion is a labour-intensive phase of ROL. AI-based machine learning models can be trained to screen abstracts and full texts based on predefined inclusion and exclusion criteria(Galli et al., 2025). Advantages include significant reduction in screening time, improved consistency and objectivity, early detection of high-impact studies and support for systematic and scoping reviews. By automating initial screening, nurse researchers can focus more on critical appraisal and interpretation of evidence.

AI-Supported Data Extraction and Synthesis:

Data extraction and synthesis are essential to transforming individual studies into meaningful conclusions (Snyder, 2019). AI tools can extract key variables such as study design, sample size, outcomes, and limitations. Opportunities in synthesis include -automated thematic analysis using NLP, Identification of relationships and trends across studies, visualization of evidence networks and enhanced meta-analysis support For nursing research, these capabilities support the development of stronger conceptual models and evidence-based guidelines.

Trend Analysis and Research Gap Identification:

AI excels in detecting patterns across large datasets. Through bibliometric analysis and machine learning, AI can identify emerging themes, underexplored areas, and declining research trends. Following are the implications for nursing research- identification of priority research areas, support for innovation and funding proposals, alignment with global healthcare needs and strategic planning for doctoral and postdoctoral research. This capability enables nurse researchers to design studies that are timely, relevant, and impactful(Valencia-Arias et al., 2025).

Enhancing Quality and Rigor of ROL:

AI enhances methodological rigor by minimizing human error and bias. Standardized algorithms ensure consistency in article selection and appraisal.

transparent and reproducible ROL processes, improved critical appraisal accuracy, enhanced reporting standards and support for evidence-based nursing practice. AI-assisted ROLs strengthen the credibility and reliability of nursing research outcomes (Rony et al., 2024).

Ethical Considerations and Challenges.

Despite its advantages, the use of AI in ROL raises ethical and practical concerns. These include data privacy, algorithmic bias, transparency, and over-reliance on automated systems. The key challenges are limited access to AI tools in low-resource settings, need for AI literacy among nurse researchers, potential exclusion of qualitative nuances and ethical responsibility in AI-assisted decision-making (Memarian & Doleck, 2023). Addressing these challenges requires balanced integration of AI with human expertise and ethical governance.

Implications for Nursing Education and Practice:

AI-enabled ROL has implications beyond research. Nursing education can incorporate AI tools to train students in advanced literature analysis(El-Banna et al., 2025). In practice, AI-informed evidence synthesis supports clinical guidelines, policy development, and quality improvement initiatives. By strengthening the evidence base, AI-enhanced ROL contributes to improved patient outcomes and professional nursing standards.

Conclusion:

Artificial Intelligence presents transformative opportunities for the latest Review of Literature in nursing research. By enhancing literature search, screening, synthesis, and trend analysis, AI addresses longstanding challenges associated with traditional ROL methods. While ethical and practical considerations remain, thoughtful integration of AI can significantly strengthen the quality, efficiency, and impact of nursing research. Embracing AI-driven ROL methodologies will empower nurse researchers to generate robust evidence, advance nursing science, and contribute meaningfully to healthcare innovation.

References:

1. da Costa, T. P., da Costa, D. M. B., & Murphy, F. (2024). A systematic review of real-time data monitoring and its potential application to support dynamic life cycle inventories. Environmental Impact Assessment Review, 105, 107416.

2. El-Banna, M. M., Sajid, M. R., Rizvi, M. R., Sami, W., & McNelis, A. M. (2025). AI literacy and competency in nursing education: Preparing students and faculty members for an AI-enabled future-a systematic review and meta-analysis. Frontiers in Medicine, 12, 1681784.

3. da Costa, T. P., da Costa, D. M. B., & Murphy, F. (2024). A systematic review of real-time data monitoring and its potential application to support dynamic life cycle inventories. Environmental Impact Assessment Review, 105, 107416.

4. El-Banna, M. M., Sajid, M. R., Rizvi, M. R., Sami, W., & McNelis, A. M. (2025). AI literacy and competency in nursing education: Preparing students and faculty members for an AI-enabled future-a systematic review and meta-analysis. Frontiers in Medicine, 12, 1681784.

5. Galli, C., Gavrilova, A. V., & Calciolari, E. (2025). Large Language Models in Systematic Review Screening: Opportunities, Challenges, and Methodological Considerations. Information, 16(5), 378.

6. Khosravi, M., Zare, Z., Mojtabaeian, S. M., & Izadi, R. (2024). Artificial Intelligence and Decision-Making in Healthcare: A Thematic Analysis of a Systematic Review of Reviews. Health Services Research and Managerial Epidemiology, 11, 23333928241234863.

7. Kovari, A. (2025). A systematic review of AI-powered collaborative learning in higher education: Trends and outcomes from the last decade. Social Sciences & Humanities Open, 11, 101335.

8. Memarian, B., & Doleck, T. (2023). Fairness, Accountability, Transparency, and Ethics (FATE) in Artificial Intelligence (AI) and higher education: A systematic review. Computers and Education: Artificial Intelligence, 5, 100152.

9. Patrician, P. A., Campbell, C. M., Javed, M., Williams, K. M., Foots, L., Hamilton, W. M., House, S., & Swiger, P. A. (2024). Quality and Safety in Nursing: Recommendations From a Systematic Review. Journal for Healthcare Quality, 46(4), 203–219.

10. Rezaei, M. (2025). Artificial intelligence in knowledge management: Identifying and addressing the key implementation challenges. Technological Forecasting and Social Change, 217, 124183.

11. Rony, M. K. K., Kayesh, I., Bala, S. D., Akter, F., & Parvin, Mst. R. (2024). Artificial intelligence in future nursing care: Exploring perspectives of nursing professionals - A descriptive qualitative study. Heliyon, 10(4), e25718.

12. Shaheen, N., Shaheen, A., Ramadan, A., Hefnawy, M. T., Ramadan, A., Ibrahim, I. A., Hassanein, M. E., Ashour, M. E., & Flouty, O. (2023). Appraising systematic reviews: A comprehensive guide to ensuring validity and reliability. Frontiers in Research Metrics and Analytics, 8, 1268045.

13. Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. Journal of Business Research, 104, 333–339.

14. Valencia-Arias, A., Jimenez Garcia, J. A., Alvites Adan, T. E., Martínez Rojas, E., Valencia, J., Agudelo-Ceballos, E., Uribe Bedoya, H., & Moreno López, G. A. (2025). Trends in the sustainable use of artificial intelligence: A bibliometric approach. Discover Sustainability, 6(1), 374.

15. Wei, Q., Pan, S., Liu, X., Hong, M., Nong, C., & Zhang, W. (2025). The integration of AI in nursing: Addressing current applications, challenges, and future directions. Frontiers in Medicine, 12, 1545420.

"Opportunities for Data Analysis Using Artificial Intelligence in Nursing Research"

Mrs. Sampada Vardhe,

Head of MKSSS-AIT, Center for Data Science, Machine Learning & AI.

Nursing research plays a critical role in improving patient care, clinical decision-making, and healthcare policy. As healthcare systems increasingly rely on data-driven insights, nurses are expected to engage with research data and statistical findings. However, limited statistical training, fear of quantitative analysis, and perceived technical complexity often hinder nurses' active participation in research.

Artificial Intelligence (AI) has emerged as a transformative tool across healthcare domains, offering opportunities to simplify data analysis and interpretation. In nursing research, AI can support data understanding, automate routine analytical tasks, and translate numerical outputs into meaningful clinical insights.

Role of AI in Nursing Research Data Analysis:

AI enhances multiple stages of the research data lifecycle, particularly during data exploration, analysis, and interpretation. Rather than replacing statistical knowledge, AI acts as an intelligent assistant that supports researchers by understanding datasets, generating descriptive statistics, explaining analytical results in clinical language, and guiding appropriate test selection.

AI-Supported Descriptive and Inferential Statistics:

To demonstrate the practical application of AI, a simple clinical trial dataset is used as an illustrative example. The focus is on statistical methods commonly employed in nursing research, including descriptive statistics and basic inferential techniques.

AI tools assist nurses in performing and interpreting:

- t-tests for comparing means between groups.
- Chi-square tests for examining associations between categorical variables

- Analysis of Variance (ANOVA) for comparing multiple groups
- Correlation analysis for exploring relationships between variables

AI supports these analyses by guiding test selection, performing calculations, and explaining outcomes in plain clinical language. This enables nurses to understand not only statistical significance but also the practical implications of research findings in patient care and education.

Understanding tests:

- **t-tests for Comparing Means**- AI assists nurses in performing t-tests for comparing means between groups, making it easier to determine if differences in patient outcomes are statistically significant.
- **Chi-square Tests for Associations-** Chi-square tests help examine associations between categorical variables, with AI providing clear explanations of relationships in clinical contexts.
- **Analysis of Variance (ANOVA)-** ANOVA enables comparison of multiple groups simultaneously, helping nurses understand differences across various patient populations or treatment protocols.
- **Correlation Analysis-** Correlation analysis explores relationships between variables, revealing how different factors may influence patient outcomes and care quality

AI-Assisted Data Analysis Using Microsoft Excel:

Microsoft Excel remains one of the most widely used tools in nursing education and healthcare institutions. Integrating AI capabilities with Excel provides a highly accessible pathway for AI adoption in nursing research.

AI-assisted Excel workflows demonstrated in this study include:

- Automatic generation and correction of formulas
- Support for data organization and cleaning
- Creation of charts and visual summaries
- Interpretation of trends and patterns

By enhancing a familiar platform, AI allows nurses to perform meaningful data analysis without requiring programming knowledge. This integration promotes wider adoption of AI tools across nursing education and research environments..

Enhancing Accessibility Through Familiar Tools:

Excel + AI ---A powerful combination for nursing research By enhancing a familiar platform, AI allows nurses to perform meaningful data analysis without requiring programming knowledge This integration promotes wider adoption of AI tools across nursing education and research environments.

Ethical and Responsible Use of AI in Nursing Research:

Ethical considerations are central to the integration of AI in nursing research. Responsible AI use requires attention to data privacy, transparency, and accountability. Researchers must ensure that patient data are protected, analytical processes are understandable, and AI outputs are critically evaluated.

AI should be used strictly as a decision-support tool, not as a substitute for professional judgment. Human oversight remains essential to ensure ethical compliance, clinical relevance, and research integrity. Aligning AI use with nursing ethical standards ensures that technological advancement supports, rather than compromises, professional values.

Implications for Nursing Education, Research, and Leadership:

- **Nursing Education-** AI strengthens nursing education by making data analysis more accessible and building confidence in research engagement among students and educators.
- **Research Quality Through AI-**supported statistical analysis, nurses can engage confidently with research data and interpret findings within clinical contexts.
- **Professional Leadership** AI functions as a supportive research assistant that strengthens patient care and leadership when applied ethically and responsibly.

Advancing Evidence-Based Nursing Through AI:

Artificial Intelligence presents a significant opportunity to transform data analysis in nursing research by making it more accessible, efficient, and meaningful. Through AI-supported statistical analysis and Excel-based workflows, nurses can engage confidently with research data and interpret findings within clinical contexts. When applied ethically and responsibly, AI functions as a supportive research assistant that strengthens nursing education, research quality, patient care, and leadership. As healthcare continues to evolve, integrating AI into nursing research practices will be essential for advancing evidence-based nursing and professional development.

"AI for Patient Monitoring and Predictive Analysis"

Capt. Dr. Indira Rani,

Director of Nursing, Yashoda Medicity, Gaziabad, NCR.

Artificial Intelligence (AI) is reshaping patient monitoring by strengthening the core pillars of nursing vigilance while enabling health systems to move from reactive responses to predictive, proactive care. Nurses have long been the first line of defence in recognising patient deterioration through continuous observation, clinical judgement, and timely intervention. However, increasing patient acuity, workforce shortages, and the exponential growth of clinical data have made it increasingly difficult for nurses and clinicians to synthesise information rapidly and consistently. AI-enabled patient monitoring offers an opportunity to support this essential work by transforming complex data streams into meaningful, actionable insights that enhance patient safety.

AI systems analyse real-time and longitudinal data from vital signs, laboratory values, electronic health records, bedside devices, and wearable technologies to identify patterns that precede clinical deterioration. Predictive analytics can anticipate risks such as sepsis, respiratory compromise, unplanned ICU transfers, falls, pressure injuries, medication-related adverse events, and hospital readmissions—often hours before these conditions become clinically evident. Unlike traditional monitoring systems that rely on static thresholds, AI tools recognise trends and subtle deviations unique to each patient. For nurses, this early awareness provides valuable time to assess patients, initiate timely interventions, escalate concerns, and coordinate care with the multidisciplinary team.

Crucially, AI does not replace clinical judgement; it strengthens it. By reducing alarm fatigue and highlighting patients at highest risk, AI supports prioritisation in busy wards and critical care environments. This enables nurses to focus more on direct patient care, therapeutic communication, and compassionate presence—elements of care that remain uniquely human. When thoughtfully integrated, AI acts as a clinical co-pilot, supporting safe decision-making while preserving professional autonomy and accountability.

From a policy and health system perspective, AI-enabled patient monitoring aligns closely with global priorities of patient safety, quality improvement, and value-based care.

Early detection of deterioration and prevention of avoidable adverse events can reduce morbidity, length of stay, and healthcare costs, while supporting more efficient use of limited human resources. Predictive insights can also inform acuity-based staffing, resource allocation, and system-level planning. However, these benefits can only be realised through strong governance frameworks that address data privacy, cybersecurity, algorithmic transparency, and bias mitigation. Trust in AI depends on clear accountability, clinical validation, and alignment with patient safety standards.

Successful adoption requires meaningful engagement of nurses and clinicians in the design, implementation, and evaluation of AI systems. Education and digital literacy are essential to ensure confidence, appropriate use, and sustained impact. Policies that promote workflow integration, clinician ownership, and continuous monitoring of outcomes will be critical. Equally important is ensuring equity, so that AI-enabled monitoring strengthens care delivery across diverse and resource-constrained settings rather than widening existing disparities.

As healthcare systems evolve towards smart hospitals, remote patient monitoring, and population health models, AI will play an increasingly central role. Yet the ultimate measure of success will not be technological sophistication alone, but improved patient outcomes and safer care experiences. When guided by strong nursing leadership and responsible policy, AI has the potential to enhance clinical vigilance, support resilient health systems, and protect the human touch at the heart of healthcare.

References:

1. Al-Nafjan A, Aljuhani A, Alshebel A, Alharbi A, Alshehri A. Artificial Intelligence in Predictive Healthcare: A Systematic Review. J Clin Med. 2025;14(19):6752.
2. P Hunsigi K, Lavanya C, Visweswara Rao P, Ilyas Faheem M. AI-Powered Predictive Analytics for Early Detection of Patient Deterioration: Implications for Nursing Care. J Neonatal Surg. 2025;14(7):361-72. Journal of Neonatal Surgery
3. Nematollahi Maleki R, Shahbazi S, Hoseinzadeh M, et al. Artificial intelligence-assisted nursing care: a concept analysis using Walker and Avant approach. BMC Nurs. 2025;24:1175.
4. Park Y, Chang SJ, Kim E. Exploring Applications of Artificial Intelligence in Critical Care Nursing: A Systematic Review. Nurs Rep. 2025;15(2):55.
5. Artificial Intelligence in Nursing: An Integrative Review of Clinical and Operational Impacts. Frontiers Digital Health. 2025.
6. Artificial intelligence in nursing: an integrative review of clinical and operational impacts. PubMed. 2025.
7. Hassan EA, El-Ashry AM. Leading with AI in critical care nursing: challenges, opportunities, and the human factor. BMC Nurs. 2024;23:752.

"Clinical Decision Support as a Sociotechnical Enabler of Optimized Clinical Workflows"

Prof. Dr. Koustuv Dalal,

Mid Sweden University, Sweden. Former Global Chair: International Safe Hospital Program -WHO CCCSP.

Clinical Decision Support Systems (CDSS) are computerized tools designed to deliver patient-specific clinical knowledge and recommendations. They are provided to healthcare professionals and in some cases to patients to support informed decision-making during the care delivery. By presenting relevant health information at critical points within the clinical workflow, CDSS aim to improve the quality, safety, and efficiency of healthcare delivery. This includes high-acuity settings such as emergency care. Despite their potential, the effectiveness of CDSS is often constrained by poor usability, inadequate workflow integration, alert fatigue, and limited incorporation into routine clinical practice. These challenges are becoming increasingly significant as healthcare systems face rising complexity, workforce shortages, and escalating costs. Consequently, optimal decision-making and operational efficiency are becoming more important than ever.

This work examines the evolution of clinical decision support within the broader context of healthcare systems, ranging from early rule-based alerts to modern, workflow-integrated, and learning-based approaches. It argues that effective CDSS are not merely technical tools, but sociotechnical systems that integrate clinical intent, human expertise, and organizational processes. Drawing on evidence from clinical informatics and implementation science, the study identifies key design principles, including clinical relevance, timeliness, interpretability, reliability, and seamless workflow integration. The analysis highlights the relationship between workflow optimization—how tasks and information are organized and managed in clinical environments—and decision support, defined as tools that assist clinicians in making informed decisions. Well-designed workflows form the foundation for implementing sustainable clinical decision support (CDS). When effectively integrated, CDSS can reduce clinicians' cognitive burden, promote evidence-based practice, and support proactive care delivery.

The discussion also addresses emerging CDS approaches, including predictive analytics (the use of data to forecast outcomes), machine learning (computational algorithms that learn from data), and generative artificial intelligence (AI systems that produce new content or solutions). Particular attention is given to governance, patient safety, transparency, and equity. Finally, this work presents a practical framework for designing, implementing, and evaluating CDS-enabled workflows, with an emphasis on measurable outcomes, clinician engagement, and continuous learning. By viewing CDSS as enablers of optimal clinical workflow rather than as an additional burden, healthcare organizations can more effectively realize their potential to improve patient outcomes and the clinician experience.

"Patient Monitoring, Safety, and Virtual Nursing Assistants"

Capt. Dr. Indira Rani,

Director of Nursing, Yashoda Medicity, Gaziabad, NCR.

Opening statement:

"Patient safety has always been the cornerstone of healthcare. With rising patient acuity and workforce challenges, continuous monitoring and virtual nursing assistants are emerging as critical tools. They help detect deterioration early, support nurses, and enhance patient engagement—without replacing human judgement."

1. Patient Monitoring, Safety:

Example: ICU monitoring or remote patient care scenario.

Scenario:

A 68-year-old patient with sepsis is admitted to the ICU and placed on continuous monitoring for heart rate, blood pressure, oxygen saturation, urine output, and lactate trends. An AI-driven ICU monitoring system integrates real-time vital signs with laboratory data and electronic health records.

What happens:

- The system detects subtle trends: rising heart rate, decreasing urine output, and a gradual fall in mean arterial pressure—changes that may not yet trigger standard alarms.
- The AI predicts a high risk of septic shock within the next 2 hours and alerts the bedside nurse and intensivist.
- A virtual nursing assistant prompts the nurse with evidence-based actions: reassess fluid status, check central line patency, review antibiotic timing, and escalate concerns.

Outcome:

- Early intervention (fluid resuscitation and medication adjustment) prevents clinical deterioration.
- Alarm fatigue is reduced, nurses focus on critical tasks, and patient safety improves through anticipatory care rather than reactive care.

Key message:

AI supports nurses by enhancing clinical judgment, not replacing it—strengthening early warning systems and patient safety in high-acuity settings.

Key Points:

1. Patient Monitoring & Safety
   - Continuous monitoring → early detection of deterioration → prevents adverse events.
   - AI-driven predictive analytics: sepsis alerts, fall risk detection.
   - Human judgment remains irreplaceable—technology augments care.

Quote: "Patient safety is a continuous journey guided by timely information and proactive intervention."

Example: Smart ICU alarms alert nurses before vitals reaches critical levels.

Scenario:

In a Smart ICU, a patient on mechanical ventilation shows subtle but consistent changes—slightly rising heart rate, decreasing SpO_2 variability, and increasing respiratory rate. Individually, these values remain within normal alarm limits.

Smart Alarm Action:

An AI-enabled smart alarm analyses trends rather than single thresholds and identifies a pattern suggestive of impending respiratory deterioration.

Before any vital sign reaches a critical level, the system sends a predictive alert to the bedside nurse's dashboard and mobile device.

Nursing Response:

The nurse assesses airway patency, checks ventilator settings, performs suctioning, repositions the patient, and alerts the intensivist.

Outcome:
   - Respiratory compromise is prevented
   - Emergency code activation is avoided
   - Alarm fatigue is reduced
   - Patient safety is enhanced through early, nurse-led intervention

Key Message:

Smart ICU alarms shift care from reacting to alarms to preventing deterioration—supporting nurses as the first line of patient safety.

2. Virtual Nursing Assistants (VNAs):

- 24/7 support: patient queries, vital monitoring, medication reminders.
- Reduce nurse workload and burnout; improve adherence.
- Must integrate seamlessly into existing workflows.

Quote: "Virtual nursing assistants bridge the gap between patients and healthcare teams."

Example: Post-discharge chatbot follow-ups to prevent readmissions.

3. Challenges & Considerations:

- Data privacy, cybersecurity, AI bias.
- Over-reliance → risk of reducing human touch.
- Requires staff training and clear policy frameworks.

4. Future Perspectives:

- Predictive analytics & remote monitoring extend to home care.
- VNAs evolve to proactive support, not just reporting alerts.
- Nurses spend more time on empathetic, patient-centered care.

Quote: "Technology should empower nurses, not replace them."

Closing Statement:

"Virtual nursing assistants and advanced patient monitoring are transforming healthcare, but the heart of care remains human. By combining technology with nursing expertise, we can ensure safer, more efficient, and empathetic care for every patient."

References

1. Amirsavadkouhi A, Mirtajani SB. The Role of Artificial Intelligence in the Prediction, Diagnosis, and Management of Sepsis in the Intensive Care Unit (ICU). Med Res Arch. 2025 Oct 31;13(10):6751. AI in ICU sepsis detection, predictive analytics, and personalized care. European Society of Medicine -

2. Hunsigi PH, Lavanya C, Visweswara Rao P, Ilyas F. AI-Powered Predictive Analytics for Early Detection of Patient Deterioration: Implications for Nursing Care. J Neonat Surg. 2025 May 12;14(7):361-72. AI analytics can detect deterioration early and inform nursing responses. Journal of Neonatal Surgery

3. Exploring Applications of Artificial Intelligence in Critical Care Nursing: A Systematic Review. Nurs Rep. 2025;15(2):55. Systematic review of AI applications in critical care nursing, including monitoring and prediction. MDPI

- AI-Enhanced Intensive Care Unit Monitoring and Management. J AI Healthcare Med. 2024-2025;4(1):1-9. Discusses continuous ICU monitoring with AI for early warnings and management. Health Science Publishing

- A retrospective cross-sectional study showing wearable smartwatches enhance patient safety and efficiency in the intensive care unit. Commun Med. 2025; Smart wearables improve alarm response and reduce alarm fatigue. Nature

- Artificial intelligence in critical care nursing: A scoping review. Aust Crit Care. 2025;38:101225. AI applications in monitoring, decision support, predictive analytics in ICU nursing. ScienceDirect

- Artificial intelligence in critical care nursing: A scoping review (PubMed). PubMed. 2025; Reports predictive analytics as key for complications like sepsis prediction. PubMed

- Artificial intelligence applications in intensive care unit nursing: A narrative review (2020–2025). Digit Health. 2025; Synthesizes trends in ICU AI monitoring and clinical support. PMC

- Leading with AI in critical care nursing: challenges, opportunities, and the human factor. BMC Nurs. 2024 Oct 14;23:752. Addresses ethical/human issues of AI in nursing and care support. SpringerLink

- A novel artificial intelligence based intensive care unit monitoring system: using physiological waveforms to identify sepsis. PubMed. 2020-2024; AI waveform models for early sepsis detection from ICU data. PubMed

AI in Nursing: Safeguarding Ethics Through Leadership and Policy Advocacy

Dr. Tripti Nanda,

Director of Quality & Nursing Services, Noble Hospitals & Research Centre, Pune

Artificial Intelligence (AI) is rapidly transforming healthcare by enhancing clinical efficiency, risk prediction, workflow optimization, and patient outcomes. AI-enabled tools support predictive analytics, risk stratification, documentation, and decision support across multiple care settings. While these advancements promise significant improvements, they also introduce complex ethical challenges that demand deliberate leadership, governance, and policy advocacy.

Nurses, who constitute the largest segment of the healthcare workforce, play a pivotal role in safeguarding ethical practice in this evolving digital landscape. Nursing leadership ensures that AI applications uphold core ethical principles, including autonomy, justice, beneficence, non-maleficence, and respect for persons, while preserving patient trust, professional integrity, and relational care.

1. Data Privacy and Security in AI-Enabled Nursing Practice:

AI relies heavily on sensitive patient data sourced from electronic health records (EHRs), wearable devices, diagnostic platforms, and remote monitoring systems. While this integration enables early detection of clinical deterioration and personalized care, it elevates risks related to privacy breaches, unauthorized access, and secondary data misuse.

Key Ethical Risks:

- Unauthorized access to protected health information (PHI)
- Cyberattacks targeting centralized AI data repositories
- Limited transparency regarding data use and sharing
- Secondary use of patient data without informed consent

Example:

A hospital implemented an AI-based sepsis prediction tool using continuous telemetry and EHR data. While clinically effective, nurses discovered that patient monitoring data were being

used to retrain the algorithm without explicit consent. Patients expressed discomfort, eroding trust.

Leadership & Policy Solutions:

- Mandate informed consent and transparent data-use policies
- Enforce robust cybersecurity measures, including encryption and audits
- Regulate third-party AI vendors through HIPAA-equivalent agreements
- Educate nursing staff on AI data risks and governance responsibilities
- Promote patient engagement and transparency regarding AI-supported processes

Impact on Patient Safety:

- Effective governance ensures AI-driven early warning systems can predict deterioration without compromising patient privacy, maintaining trust while reducing adverse events.

2. Algorithmic Bias and Health Inequity:

AI systems trained on historical clinical data may inherit and amplify existing inequities. Underrepresentation of certain populations—older adults, ethnic minorities, women, and socioeconomically disadvantaged groups—can lead to less accurate predictions and inequitable care delivery.

Evidence of Bias:

- Only 12–15% of healthcare AI studies explicitly address fairness
- Diagnostic and triage tools demonstrate reduced accuracy for underrepresented populations
- Nurses report a need for clearer policies guiding AI use to ensure fairness

Example:

 An AI triage system in an emergency department consistently under-flagged symptoms in women and certain ethnic minorities, delaying escalation of care.

Leadership Actions:

- Mandate diverse and representative training datasets
- Require subgroup performance reporting
- Conduct regular bias audits
- Protect nurses' authority to override AI recommendations

Impact on Patient Safety:

Bias mitigation ensures that all patients, regardless of demographic factors, receive timely and equitable care, preventing harm and upholding justice.

3. Transparency and Explainability:

Many AI systems function as "black boxes," offering limited insight into how outputs are generated. This lack of explainability can compromise informed consent, professional accountability, and clinician trust.

Key Risks:

- Difficulty explaining AI decisions to patients and families.
- Moral distress when AI recommendations conflict with nursing judgment.
- Challenges in documenting and justifying care decisions influenced by AI.

Example:

A clinical decision support system suggested aggressive sepsis management without displaying contributing variables. Nurses struggled to justify overriding the AI due to opaque logic.

Leadership Solutions:

- Require explainable AI standards
- Document AI-influenced clinical decisions
- Empower nurses to question and override AI outputs when necessary

Impact on Patient Safety:

Explainable AI supports informed, accountable decision-making, ensuring that patient care remains safe and nurse judgment is respected.

4. Accountability and Legal Ambiguity:

AI adoption often outpaces regulatory guidance, leaving ambiguity regarding liability for AI-assisted errors.

- 64% of nurses feel legally unprotected if AI causes harm
- 71% report that clearer policies would improve confidence

Example:

An AI deterioration-prediction tool underestimated patient risk, delaying intervention. When harm occurred, accountability remained unclear—whether it was the nurse, institution, or vendor.

Policy Imperatives:

- Define shared accountability frameworks
- Establish clear escalation and override protocols
- Advocate for national regulatory guidance

Impact on Patient Safety:

Clear accountability protects patients, nurses, and institutions, ensuring that AI tools are used safely within structured governance frameworks.

5. Impact on the Nurse–Patient Relationship:

Nursing is inherently relational, emphasizing empathy, presence, and holistic assessment. Excessive reliance on AI risks diminishing these critical aspects of care.

Example:

In a mental health unit, AI chatbots handled patient education. Patients reported reduced emotional support, and nurses missed subtle non-verbal cues.

Leadership Actions:

- Protect minimum standards for direct patient interaction
- Limit AI substitution in high-touch care areas
- Incorporate relational care metrics into quality assessments
- Impact on Patient Safety:

Preserving relational care ensures that AI enhances, rather than replaces, human assessment, maintaining early detection of subtle clinical or emotional changes.

6. Professional Autonomy and De-skilling

Over-reliance on AI as a directive tool may erode clinical reasoning and nurse autonomy.

Example:

A novice nurse depended heavily on AI prompts, overlooking subtle deterioration, resulting in reduced confidence in independent judgment.

Policy Actions:

- Define AI strictly as decision support, not decision-maker
- Align institutional policies with professional codes of ethics
- Incorporate AI-free clinical reasoning exercises in training

Impact on Patient Safety:

Supporting professional autonomy ensures nurses retain critical assessment skills, preventing missed deterioration and improving outcomes.

7. Ethical Preparedness and Education Gaps

Despite widespread AI adoption, up to 75% of nurses report limited understanding of AI ethics.

Example:

An AI documentation assistant generated inaccurate notes that were submitted without verification, exposing patients and nurses to risk.

Leadership Actions:

- Integrate AI ethics into nursing curricula and continuing professional development
- Establish nurse-led AI ethics committees
- Promote ongoing training on governance, bias mitigation, and data privacy

Impact on Patient Safety:

Educated, ethically prepared nursing staff can effectively oversee AI use, ensuring patient safety, trust, and equitable care.

8. Practical Examples of AI in Nursing:

8.1 Continuous Vital Signs Monitoring and AI-Enabled Escalation Systems:

- Real-time collection of physiological parameters and early warning scores
- Enables early detection of deterioration and structured escalation
- Reduces burden of routine measurement, allowing more time for direct care
- **Impact:** Reduced unplanned ICU transfers by 18%; increased nurse confidence and patient-centered care
- **Ethical considerations:** preserves nurse autonomy, ensures data privacy, integrates into governance

8.2 AI-Powered Incident Reporting Module:

AI-powered incident reporting can significantly advance nursing leadership, clinical decision-making, and patient safety. However, ethical challenges demand proactive governance, structured training, and policy advocacy to ensure AI strengthens—not undermines—autonomy, justice, and trust. Nursing leaders must champion ethical AI integration, embedding professional values into every stage of design, deployment, and oversight to uphold patient-centered, equitable, and safe care.

Key Features:

A. Smart Incident Reporting:

- **AI Incident Re-Creation:** Reconstructs incomplete reports using contextual understanding and historical patterns, ensuring clarity and accuracy for quality and nursing teams.
- **AI-Suggested Investigations:** Recommends appropriate audits, equipment checks, competency assessments, and documentation reviews to guide thorough investigations.
- **AI Root Cause Insights:** Suggests likely contributing factors based on trends and best practices to support evidence-based corrective actions.
- **Corrective & Preventive Actions:** Recommends actionable steps to prevent recurrence, strengthen long-term safety, and support CAPA initiatives.

B. Action-Driven Intelligence:

- **Predictive Trend Analysis:** Detects emerging risks, recurring patterns, and potential incident spikes before escalation.
- **Anomaly Detection:** Flags unusual deviations from normal trends for timely intervention.

C. AI-Generated Insights & Communication:

- **Structured Incident Summaries:** Produces organized, concise reports for rapid review by nursing leadership and quality teams.
- **Automated Safety Updates:** Summarizes critical incidents, root causes, lessons learned, preventive actions, and improvement opportunities to strengthen a culture of safety.

Impact on Nursing Leadership & Patient Care:

- **Enhanced Decision-Making:** Provides nursing leaders with actionable, data-driven insights to prioritize safety interventions effectively.
- **Reduced Administrative Burden:** Automation frees time for nurses to focus on direct patient-centered care.
- **Proactive Interventions:** Supports early corrective actions and continuous improvement, reducing patient harm.
- **Professional Empowerment:** Preserves nurses' autonomy and critical thinking by positioning AI as supportive, not directive.

Conclusion:

AI holds tremendous potential to transform nursing practice, improve patient outcomes, and optimize workflow. However, ethical challenges—privacy, bias, explainability, accountability, relational care, and professional autonomy—require robust governance, education, and policy advocacy.

Nursing leaders must champion ethical AI integration, embedding professional values at every stage of AI design, deployment, and oversight. By doing so, intelligent automation can enhance patient safety, empower nurses, and promote equitable, compassionate, and patient-centered care.

AI & Nursing: Education ,Research, Care & leadership
Data decision making and Patient care improvement

Brig Dr. Vandana Agnihotri,

Brig MNS HQ SC Pune.

Introduction:

Nursing AI tools include clinical decision support, mobile health and sensor-based technologies, and voice assistants and robotics. AI tools in nursing practice enhance patient care, efficiency, and safety through Clinical Decision Support Systems, predictive analytics for early risk detection (like sepsis or falls), virtual assistants for patient education, robotic process automation for admin, and smart monitoring (wearables), ultimately freeing nurses for complex tasks by handling data analysis and routine work, while also improving education and documentation. These technologies support nurses by providing real-time insights, automating tasks, and offering evidence-based recommendations, but human judgment remains crucial.

Key Applications of AI in Nursing:

- **Clinical Decision Support (CDS):** Analyzes patient data for evidence-based suggestions on treatments, dosages, and potential errors, improving care quality and reducing mistakes.
- **Predictive Analytics:** Forecasts patient deterioration, readmission risks, or complications (like AKI) using data from EHRs and sensors, enabling timely interventions.
- **Patient Monitoring:** AI-powered wearables and smart devices continuously collect vitals, alerting nurses to anomalies before they become critical.
- **Virtual Assistants:** Handle common patient queries, provide education on self-care, and help with appointment scheduling, reducing nurse workload.
- **Administrative Automation:** Automates tasks like charting, documentation, and reporting, allowing nurses to focus more on direct care.
- **Diagnostic Support:** Identifies issues in imaging (like X-rays) or flags stroke/STEMI rapidly, speeding up critical response.
- **Education & Training**: Generative AI creates personalized learning, simulations (virtual patients), and adaptive assessments for students and staff.

Innovative AI tools for data-driven administrative decision-making for the patient care improvement:

The biggest "patient-care impact" from administrative AI comes from removing delays, predicting bottlenecks, and standardizing decisions (staffing, bed flow, discharge readiness, supplies, referrals, escalation), while keeping clinicians firmly in-the-loop for safety and accountability—aligned with WHO's AI-for-health ethics and governance principles (human oversight, transparency, equity, privacy, accountability).

Use AI in five high-yield operational lanes (start small, scale after measurable wins):

1. **Patient flow & capacity-**
   - Predicted admissions/discharges, bed turnaround, ICU step-down timing
   - "Next 24–48 hrs" congestion forecasting and diversion prevention
2. **Staffing & skill-mix optimization-**
   - Demand-based rostering, acuity-based assignments, float-pool triggers
   - Burnout risk signals (safe, aggregated HR + workload data)
3. **Quality & safety surveillance** (admin-supported clinical escalation)-
   - Deterioration early-warning trend dashboards (not autonomous decisions)
   - Falls/pressure-injury risk rounding prioritization lists
4. **Revenue cycle & coding support (indirect patient benefit)-**
   - Documentation completeness prompts, claims-denial prediction, coding-assist
   - Faster authorizations → fewer care delays
5. **Knowledge + policy copilots for leaders-**
   - Instant SOP/QI policy summarization, incident theme detection, meeting/action tracking
   - "What changed?" briefings after new guidelines/policies (with citations and traceability)

Benefits:
   - Faster throughput, fewer missed escalations, better staffing fairness, shorter delays
   - Nurses spend more time on care, less on coordination + admin work

Considerations:
   - Clearly label "decision support" vs "decision automation." For anything that looks like clinical decision support, ensure regulatory and governance alignment (e.g., FDA's CDS framing stresses transparency and HCP ability to independently review the basis).
   - Prioritize equity testing so AI doesn't worsen disparities (language, age, gender, socioeconomic proxies).

Access cost-effective AI solutions for decision-making:

Cost-effective AI is usually not a big new platform first—it's using what you already have (EHR reports, incident systems, rostering, BI tools) + adding lightweight AI in a controlled pilot.

A practical "low-to-medium budget" access path:

 1. Start with existing data + dashboards-

 • Use your current EHR/BI stack to build the baseline KPIs (LOS, TAT, falls, readmissions, OT, sick leave).

 • Add AI only where the baseline shows a clear bottleneck.

 2. Pick "thin-slice" pilots (6–10 weeks)-

 • Example pilots: no-show prediction, discharge readiness flagging, bed turnaround forecasting, incident clustering.

 • Measure impact in ₹/hours saved + patient outcomes proxy (delays, cancellations, adverse events).

 3. Leverage open + proven building blocks-

 • Open-source analytics stack (securely deployed): PostgreSQL + Superset/Metabase; Python/R for modeling.

 • If your org already pays for Microsoft/Google/AWS, use included AI/ML credits or bundled services rather than buying a new vendor.

 4. Partner smart-

 • Academic nursing/engineering colleges for evaluation support

 • Vendors only after: baseline, pilot metric definition, governance, and exit plan are ready

Benefits

 • Faster approvals, lower procurement risk, measurable ROI before scale

 • Builds internal capability in nursing leadership teams (not vendor-dependence)

Considerations-

 • Avoid sending any patient-identifiable data to public AI chat tools unless your organization has an approved, compliant setup. (Treat privacy/security as non-negotiable.)

Evaluate the overall quality of AI tools (a nursing-leader checklist)

Quality evaluation is strongest when you combine:
- Evidence standards (clinical + economic benefit),
- Regulatory clarity (what kind of software is it?), and

- Transparent reporting (how the AI was built/tested/monitored).

NICE's Evidence Standards Framework is widely used for judging digital health evidence expectations.

Recommendation:

Use this 8-part Quality Scorecard before adopting any AI tool:

1. Use-case clarity-
- What decision does it support? Who is accountable? What's the override process?
2. Data fitness & bias checks-
- Training data relevance to your population (location, demographics, comorbidities)
- Bias testing results and mitigation plan (equity impact)
3. Clinical/operational validity (does it work?)-
- Sensitivity/specificity or error metrics, and performance by subgroup
- External validation (not just "tested internally")
4. Clinical utility (does it help in real life?)-
- Outcomes: fewer delays, fewer adverse events, reduced workload, better throughput
- For evidence expectations, benchmark against NICE ESF thinking (benefit + economic value).
5. Transparency & explainability-
- Can staff understand the "why" enough to challenge it? (FDA emphasizes HCP ability to review basis in CDS context.)
6. Safety, monitoring, and change control-
- Drift monitoring, alert fatigue review, rollback plan
- Audit trails for recommendations and overrides
7. Governance & ethics
- Align with WHO principles: protect autonomy, promote well-being, ensure transparency, responsibility, inclusiveness/equity, and sustainability.
8. Documentation quality (proof you can trust it)

Use reporting standards as "due diligence lenses," especially when vendors provide studies:
- CONSORT-AI / SPIRIT-AI for trials and protocols
- DECIDE-AI for early/live clinical evaluation studies
- TRIPOD+AI for prediction models
- If it's an LLM-based tool, insist on LLM-specific transparency (e.g., TRIPOD-LLM).

Benefits:
- Prevents "shiny tool" traps; improves patient safety, fairness, and ROI
- Creates a repeatable procurement + governance pathway

Considerations:

• Some tools may be classed as Software as a Medical Device (SaMD) depending on claims and intended use; IMDRF SaMD clinical evaluation guidance is a useful reference for what "good clinical evaluation" looks like.

Build sustained critical, creative, and innovative temperament in nursing leaders using AI

AI doesn't create innovation by itself—habits do. The winning pattern is:

curiosity → structured questioning → safe experimentation → reflection → scale.

Build a "Nursing AI Leadership Rhythm" (lightweight, repeatable):

1. Prompt literacy + critical thinking drills (weekly, 20 mins)
   - Teach leaders to ask: What's the assumption? What data supports it? What would change the decision?
   - Run "AI red-team" exercises: ask the AI for counterarguments and failure modes.
2. QI Copilot workflow (monthly)
   - Use AI to draft PDSA cycles, fishbone causes, and measurement plans—then humans verify and adapt.
   - Maintain a "Model/Tool Logbook": purpose, metrics, bias checks, incidents, updates.
3. Learning culture with evidence
   - "AI journal club" where teams critique one AI study using CONSORT-AI / DECIDE-AI / TRIPOD+AI checklists.
4. Innovation guardrails (always-on)
   - Privacy rules, escalation rules, and "no autonomous clinical decisions" unless formally approved
   - Align to WHO governance principles to keep innovation ethical and trusted.

Benefits:

- Leaders become "evidence-first innovators," not tool-chasers
- Improves confidence, accountability, and team adoption

Considerations:

- AI outputs must be treated as draft hypotheses, not final truth—especially in healthcare operations that can affect safety.

Application of AI Tools in Nursing Administration:

1) AI tools that improve patient care through better staffing decisions:

In tertiary hospitals, staffing problems are usually driven by volatile demand + uneven acuity + skill-mix mismatch (not just "headcount").

The most effective AI use is predict → optimize → monitor, while keeping humans accountable for final decisions (WHO's AI governance emphasis on oversight, transparency, equity, and safety).

Use AI in 4 "staffing decision layers" (start with Layer 1–2; they give the fastest ROI):

Layer 1 — Demand forecasting (the "How many?")

• Predict admissions/ED boarding, OT case-load, discharges, ICU step-downs for the next 24–72 hours

• Output: shift-wise demand curves for each unit/service line

Layer 2 — Acuity-based staffing (the "Where and what level?")

• Convert acuity + dependency into nurse-hours-per-patient-day (NHPPD) targets or workload scores

• Output: safer assignments, fewer "silent overload" shifts

• Practical approach: digital acuity forms + automated dashboards (many hospitals start here because it's implementable).

Layer 3 — Scheduling & optimization (the "Who, when?")

• Constraint-based scheduling: leave rules, fairness, skill mix, rotation policies, fatigue limits

• Output: reduced OT spikes, fewer last-minute gaps, better fairness.

Layer 4 — Real-time staffing command center (the "Now what?")

• Live view of: call-ins, surges, transfers, nurse workload balance

• Suggests actions: float pool triggers, redeployment options, escalation to staffing office Benefits.

• Better patient coverage during surges, fewer unsafe ratios, reduced burnout/OT, improved continuity.

Considerations:

• If any tool claims to influence clinical decisions, treat it like CDS and insist on transparency so staff can independently review the basis (FDA CDS guidance concept).

• Test for equity (units serving high-complexity/low-resource populations often get unintentionally penalized by "productivity-only" models).

2) How to access cost-effective AI-driven staffing solutions:

The cheapest wins usually come from using existing systems (ADT/bed management + EHR + rostering + HR/leave) and adding lightweight AI/optimization rather than buying a giant platform first.

A cost-effective pathway for a tertiary hospital:

 1. Use your existing BI tool (Power BI/Tableau) as the "front door"
 • Build baseline staffing KPIs: fill-rate, OT hours, agency %, sick leave, nurse-to-patient by unit/shift, acuity proxy, adverse events
 2. Add prediction (low-cost) before adding automation (high-risk)
 • Start with demand forecasting and call-in probability (aggregated) → then move to schedule optimization
 3. Use "optimization engines" you can host internally
 • Common pattern: a small internal model + an optimizer (e.g., constraint solver) connected to rostering rules
 • Keeps vendor costs down and privacy control up
 4. Pilot one unit type first
 • Choose a unit with measurable pain: ED observation, ICU step-down, high-turnover med-surg, OT-heavy specialty ward
 • 6–10 week pilot, then scale

Benefits:

 • Faster procurement, less lock-in, easier to prove ROI (₹ saved in OT/agency + quality indicators)

Considerations:

 • Don't use public AI chat tools with staffing rosters containing identifiable details unless your org has approved controls (privacy + security is core to WHO governance thinking).

3) How to evaluate the overall quality of AI staffing tools (quick scorecard):

A staffing AI tool is "good" only if it proves real-world operational benefit without harming safety, fairness, or trust. NICE's Evidence Standards Framework is a strong model for judging evidence expectations for digital tools.

Use this 10-point Staffing AI Quality Scorecard:

    1. Use-case fit (forecasting? acuity? rostering? command center?)
    2. Local validity (tested on hospitals like yours; tertiary complexity matters)

3. Outcome impact (OT ↓, agency ↓, fill-rate ↑, missed breaks ↓, patient safety indicators stable or better)

4. Fairness & bias testing (unit-level and subgroup checks; no "penalizing" heavy-acuity units)

5. Explainability (why it recommends redeployment/schedule changes)

6. Human override + audit trail (who overrode what and why)

7. Alert fatigue controls (few, high-quality recommendations > many nags)

8. Data governance (access control, PHI handling, retention)

9. Monitoring & drift plan (seasonality, outbreaks, festival surges, staffing policy changes)

10. Evidence quality (reports/studies align with recognized reporting expectations; for digital health evidence consider NICE ESF; for decision-support transparency align to FDA CDS principles).

Benefits are it Stops "shiny tool" buying; makes vendor comparison objective and repeatable. But If a vendor shows "studies," ask: external validation? comparable setting? what changed operationally, not just accuracy?

4) Creating sustained critical, creative, innovative temperament in nursing leaders using AI:

The temperament you want comes from a repeatable practice:

  question → test → learn → improve, not from one-time AI training. WHO emphasizes trustworthy governance; your leadership culture supplies the trust.

Introduce a simple Nursing AI Leadership Cadence:

Weekly (15–20 min): "AI Critical Thinking Drill"

Ask 3 questions every time AI suggests staffing changes:

1. What assumption is it making?
2. What data might be missing?
3. What would make this unsafe or unfair?

Monthly (45 min): "QI + Staffing Lab"

- Use AI to draft: a PDSA cycle, measurement plan, and staff communication — then leaders refine and validate

Quarterly (60 min): "Red-team day"

- Teams try to break the model: surge scenario, mass sick leave, ICU overflow
- Decide hard safeguards (override rules, escalation thresholds)

Benefits:

- Leaders become confident, evidence-led innovators; frontline trust increases

Group activity 1: "AI-Enabled Patient Care Improvement Sprint" (60–75 mins)

Adults learn AI best by doing: define a problem, test an AI-supported plan, then stress-test risks and ethics.

Activity structure (teams of 5–7):

Step 1 (10 mins): Pick one admin point

Examples: discharge delays, night shift staffing gaps, OT spikes, high falls in one ward, delayed referrals.

Step 2 (15 mins): Data-to-decision map

Teams fill a one-page canvas:

Decision owner, data inputs, current workflow, failure points, outcome metric.

Step 3 (15 mins): "AI proposal" (no PHI)

Use AI (or a facilitator-provided AI output) to generate:

3 interventions + a simple prediction idea (e.g., "discharge readiness risk score")

- A PDSA plan with measures

Step 4 (15 mins): Red-team & ethics check

Each team swaps with another team and critiques using a mini-scorecard:

Bias risks, explainability needs, monitoring, alert fatigue, safety fallbacks

(Reference WHO principles + NICE-style evidence expectations.)

Step 5 (10 mins): Pitch + vote

Each team presents in 2 minutes: "Problem → AI-assisted change → metrics → safeguards."

Benefits:
- Converts AI from "theory" into a safe, measurable nursing-led improvement plan
- Builds critical thinking, creativity, teamwork, and governance mindset

Considerations:
- Use synthetic/de-identified scenarios only
- Ensure the final takeaway includes who owns the decision and how safety is maintained

Group activity 2 (staffing-focused): "72-Hour Staffing War-Game + AI Plan" (60–75 mins)

Staffing capability improves fastest when teams practice realistic surge scenarios and use AI thinking to design safer, fairer responses.

Teams of 6–8 (Nurse manager + staffing office rep + quality/safety + HR/roster + one senior nurse)

Scenario (given by facilitator): "Next 72 hours: ED surge + 12% sick calls + 6 ICU step-downs pending + OT list full."

Task steps-

1. Baseline map (10 min): current rules, float pool availability, skill mix constraints
2. AI proposal (15 min): teams design an AI-supported plan (forecast + redeploy + schedule changes)
3. Safety & fairness check (15 min): who gets burdened? breaks? night duty fairness? high-acuity coverage?
4. Metrics (10 min): choose 6 metrics (OT hours, fill rate, missed breaks, patient falls/incident proxy, agency %, staff satisfaction pulse)
5. Pitch (10 min): 2-minute leadership briefing per team.

Benefits:

• Builds operational creativity + critical thinking under pressur
• Produces a usable "staffing surge SOP" output.

Conclusion:
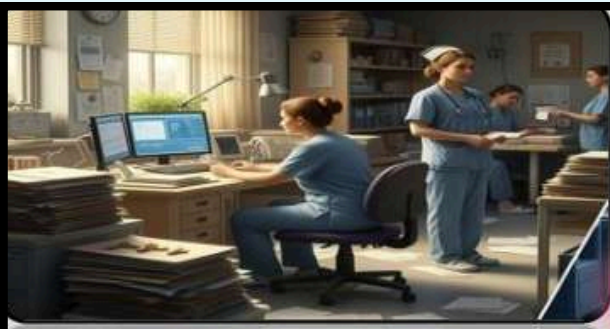
Benefits of AI for Nurses:

- Reduces workload and burnout by automating routine tasks.
- Enhances clinical judgment and decision-making.
- Empowers patients through better digital tools.
- Frees up time for complex, compassionate care.

Challenges:

- Requires ethical considerations and training for effective implementation.
- Need to balance AI insights with human intuition and empathy.
- AI (Artificial Intelligence) in nursing - its impact and application

Poster Presented by Ms. Disha Jondhale

The New Era of Nursing...
(AI in Nursing education)

INTRODUCTION-

Artificial Intelligence (AI) is increasingly being integrated into various fields, including healthcare and nursing education. This integration involves incorporating AI concepts, technologies, and applications into the nursing curriculum. It aims to prepare nursing students for the evolving healthcare landscape, equip them with essential AI-related skills, and enhance their ability to provide safe and efficient patient care.

AIMS - To enhance nursing education by using AI for smarter learning, better skill training, and efficient evaluation.
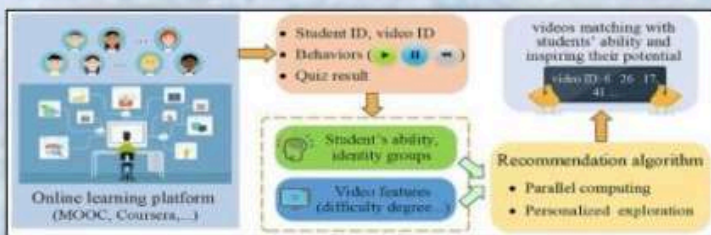
OBJECTIVES-

AI in Nursing education will lead to :
• adapt personalized and adaptive learning.
• improve skill training using AI simulations and automated assessment.
• support evidence-based learning through intelligent information access.
• streamline academic tasks like evaluation and progress tracking
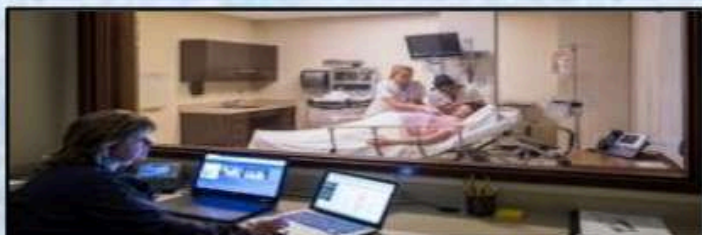
METHODS OF UTILISING AI IN NURSING EDUCATION

1. Personalised learning
2. Simulation based training
3. Smart assessment tool
4. AI learning assistant
5. Natural Language Processing
6. Remote learning and Telelhealth
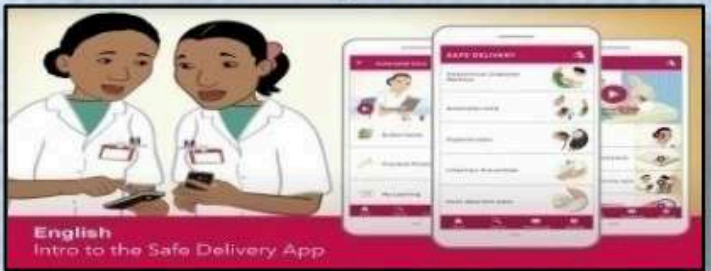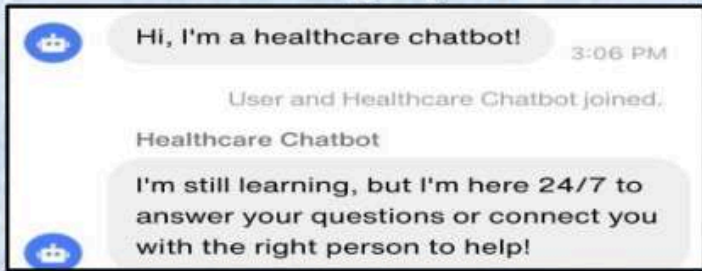
Pros of AI in Nursing education
1. Personalized learning based on students needs
2. Virtual simulation for safe clinical practice
3. Smart assessment and instant feedback
4. 24/7 learning support through AI tools
5. Improve critical thinking and decision making
6. Reduces faculty workload

Cons of AI in Nursing education
1. Reduces human interaction
2. High cost of AI technologies
3. Over dependence on technology
4. Data privacy and security risk
5. Limited hands on clinical exposure
6. Digital skill gap among users
7. Lack of emotional intelligence
8. Unequal access

Challenges of implementing AI in Nursing education
1. Expensive Simulators and virtual labs
2. Lack of infrastructure
3. Faculty skill gap
4. Overuse of AI tutors
5. Limited hands on practice comparing to real patient care experience
6. Data privacy issue
7. Loss of Human judgement
8. Ethical concerns as AI tools are trained using existing data , if its incomplete it may unfairly assess.
9. Resistance to change
10. Lack of standardized AI curriculum in nursing education

Strategies to overcome challenges of AI in Nursing education
1. Provide regular AI training program
2. Use AI as a support not a replacement
3. Maintain balance between AI simulators and real clinical practice
4. Regularly audit AI systems for accuracy
5. Promote blended learning
6. Adopt cost effectives and open source AI platforms
7. Involve Nursing experts in AI system design
8. Encourage faculty – student interaction alongside AI tools.
9. Provide equal access to AI tools for all
10. Curriculum Integration

SUMMARY : AI in Nursing education provide opportunities for students to develop critical thinking, decision-making, and data analysis skills in the context of AI in healthcare. While AI has the potential to revolutionize nursing education and practice, it also presents certain challenges and considerations. These include ethical concerns related to data privacy, algorithm transparency, and potential biases in AI algorithms. It is essential to address these challenges and ensure responsible use of AI in nursing education. To overcome the risks and challenges associated with teaching AI in nurse education, strategies such as comprehensive curriculum design, faculty development and training, hands-on practical experiences, collaboration with industry experts, and continuous learning and adaptation are crucial.

REFERENCES :

•Vinit, Kumar , Ramawat, Ravikant, Bhatt, Sunita & Ramawat, Vinit. (2024). The Role of Artificial Intelligence in Nursing: Advancements, Challenges, and Future Directions. 45. 1277-1283.

•WHO . Ethics and governance of artificial intelligence for health , 2021

•Indian Nursing council. National curriculum framework for nursing education, New Delhi 2021
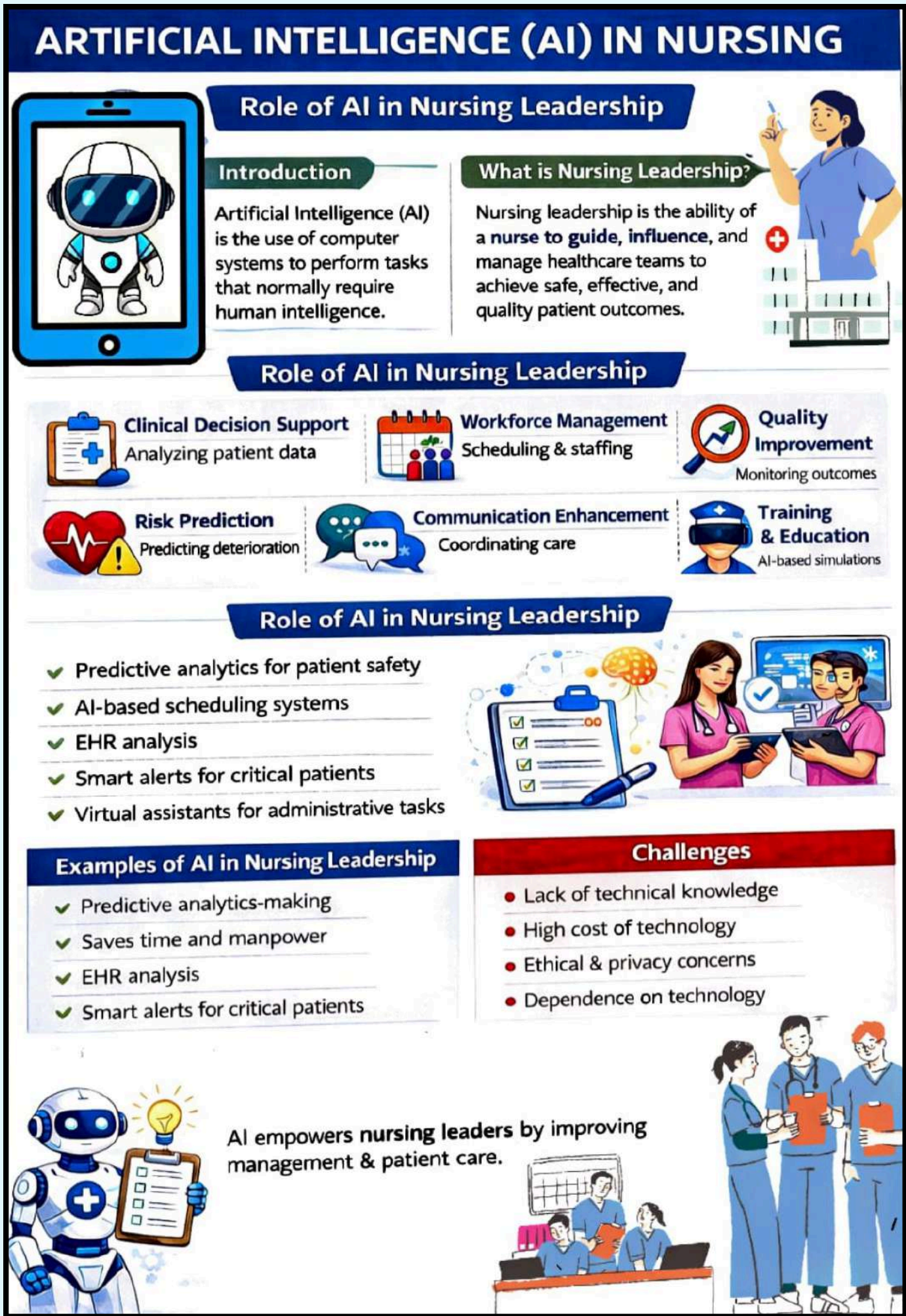
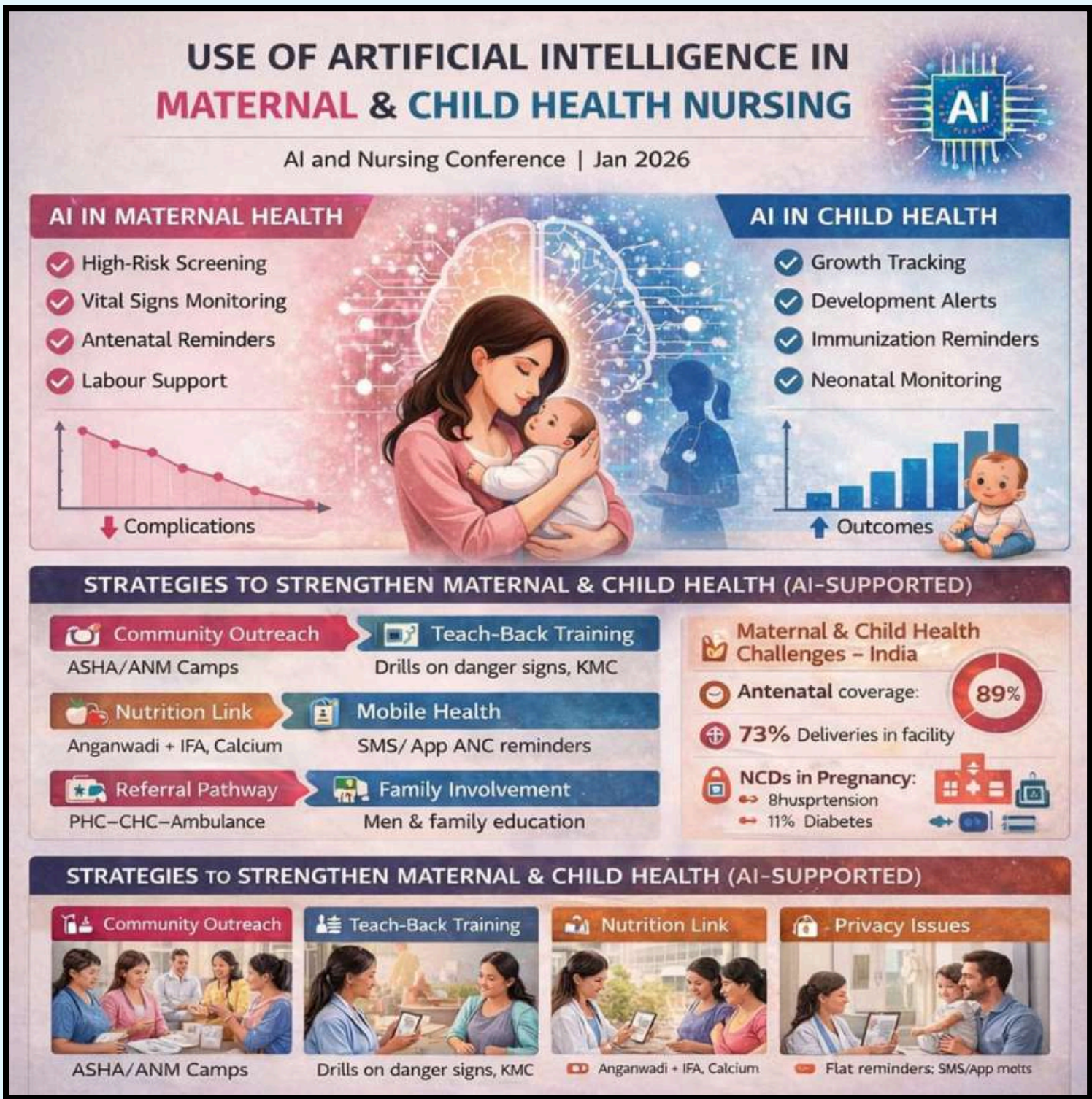## Poster Presented by Ms. Divya Shirke and group

Poster Presented by Mayuri M.Nijampurkar
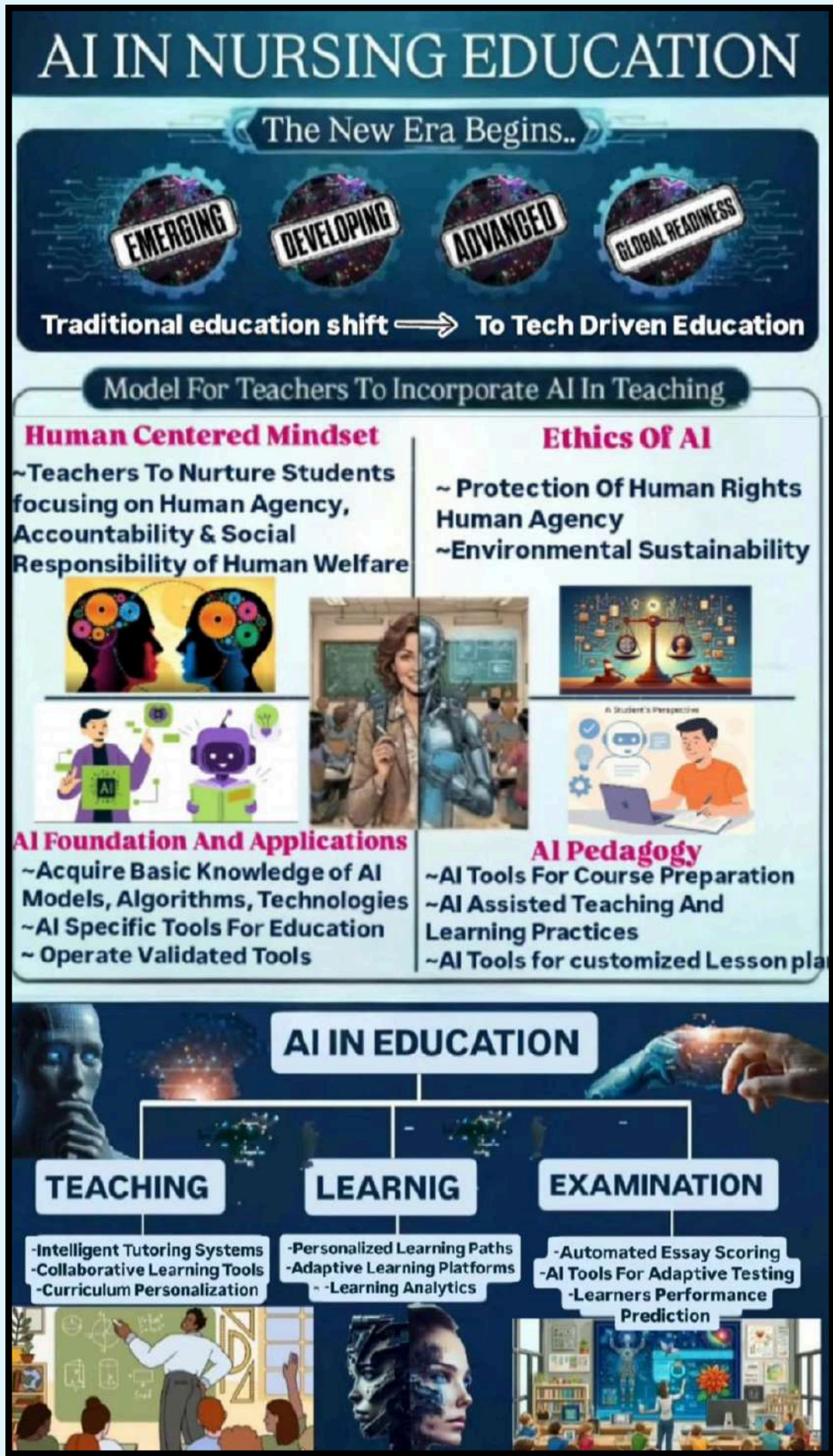
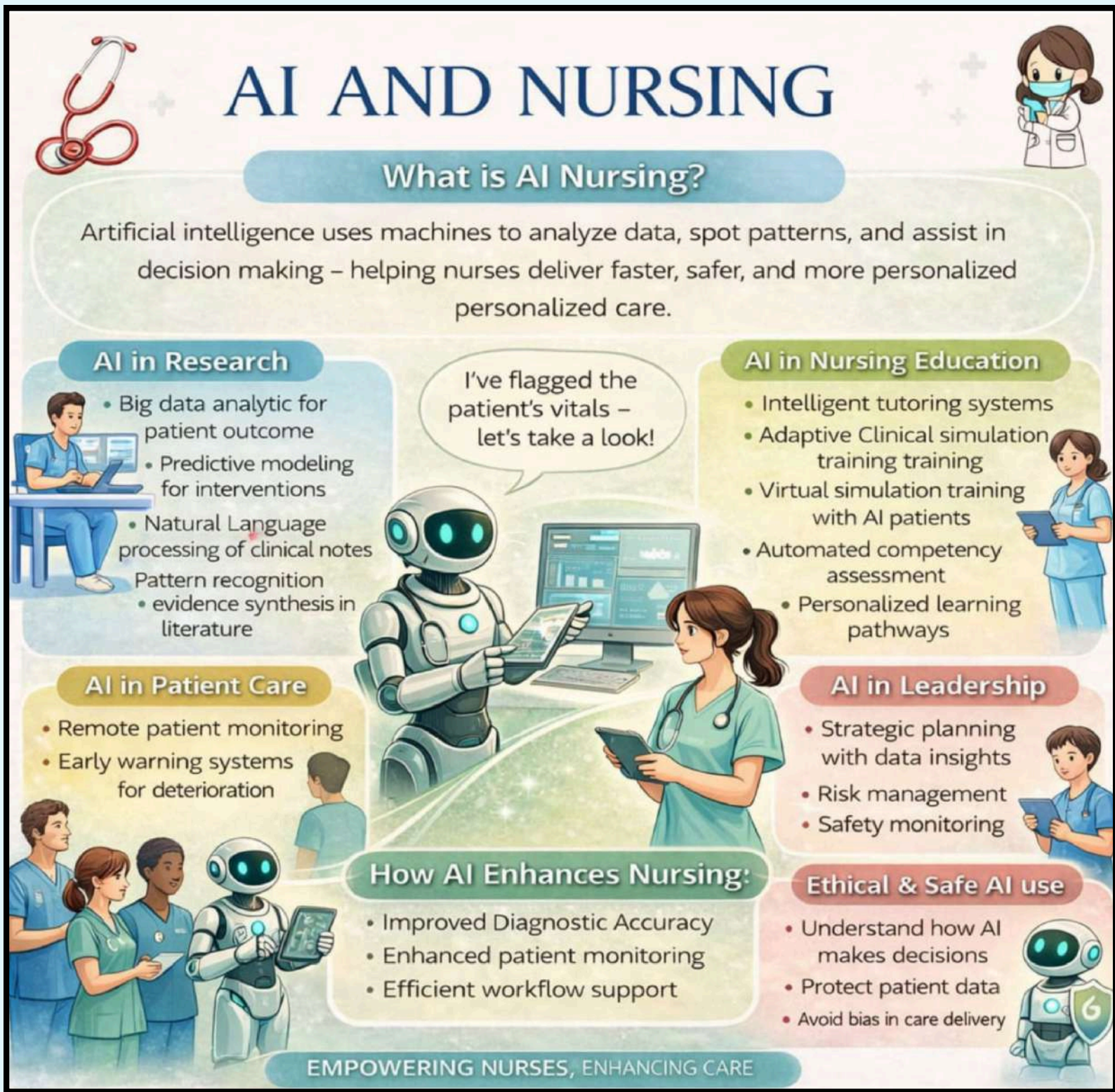## Poster Presented by Ms. Tanisha Taware and group

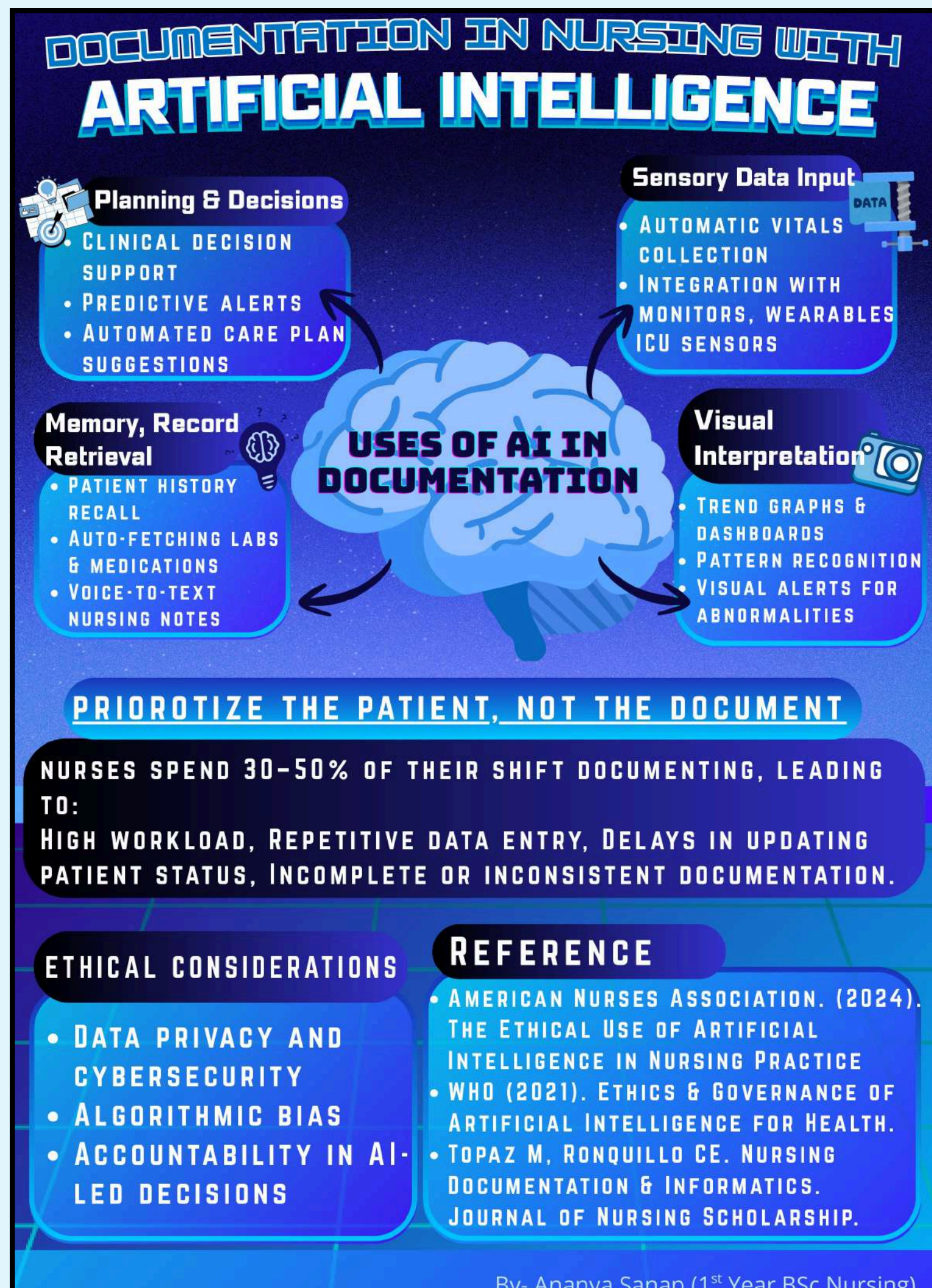## Poster Presented by Ms. Pranita Chavan

Poster Presented by Dr. Madhavi Ghorpade

Poster Presented by Ms. Neha Shengale And Group

Poster Presented by Ms. Ananya Sanap
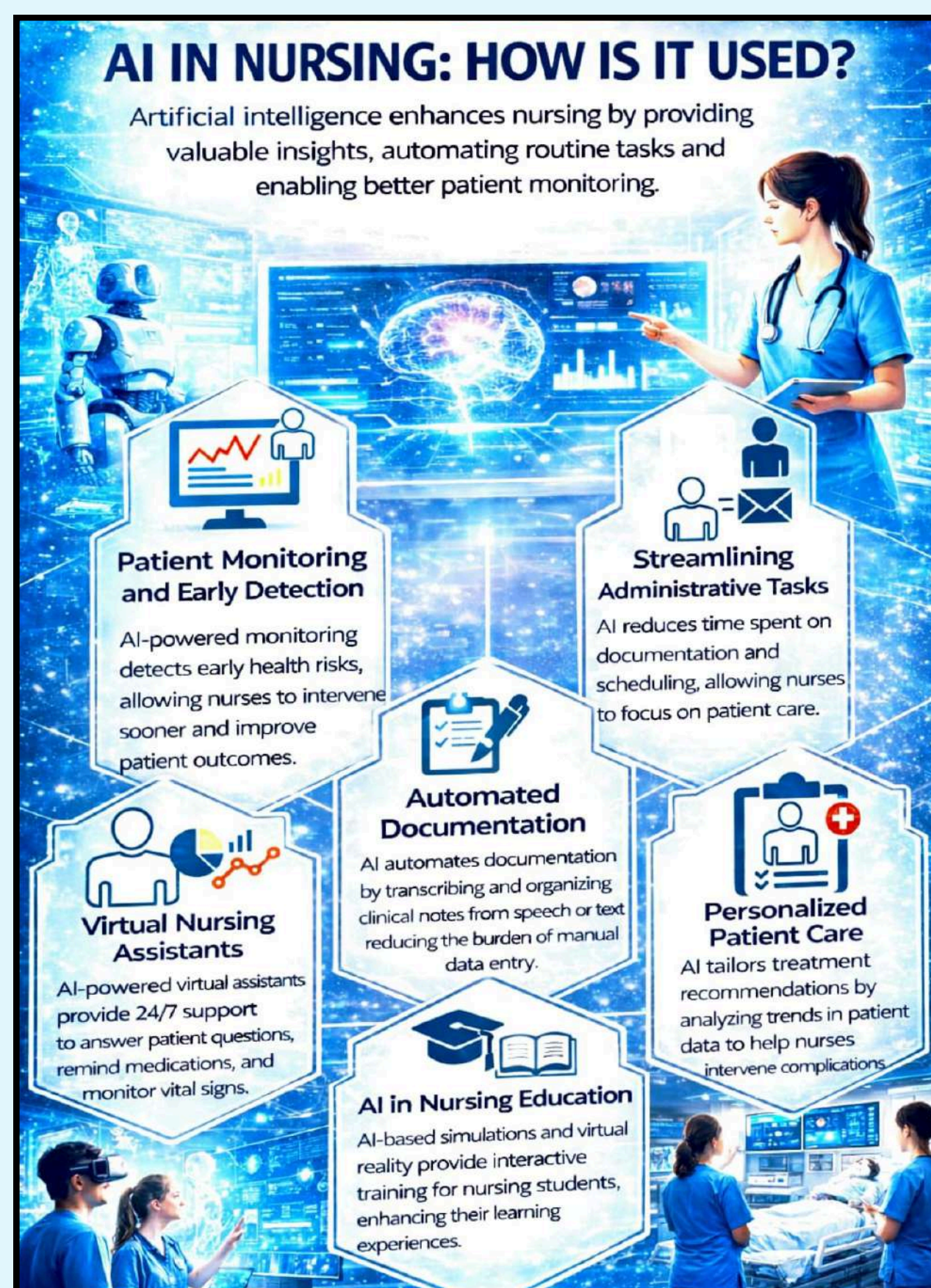

Poster Presented by Ms. Priyanka Kshirsagar

Poster Presented by Ms. Pranita Kulkarni

Poster Presented by Ms. Mayuri Renuse and group

Poster Presented by Ms. Ujwala Nandyal
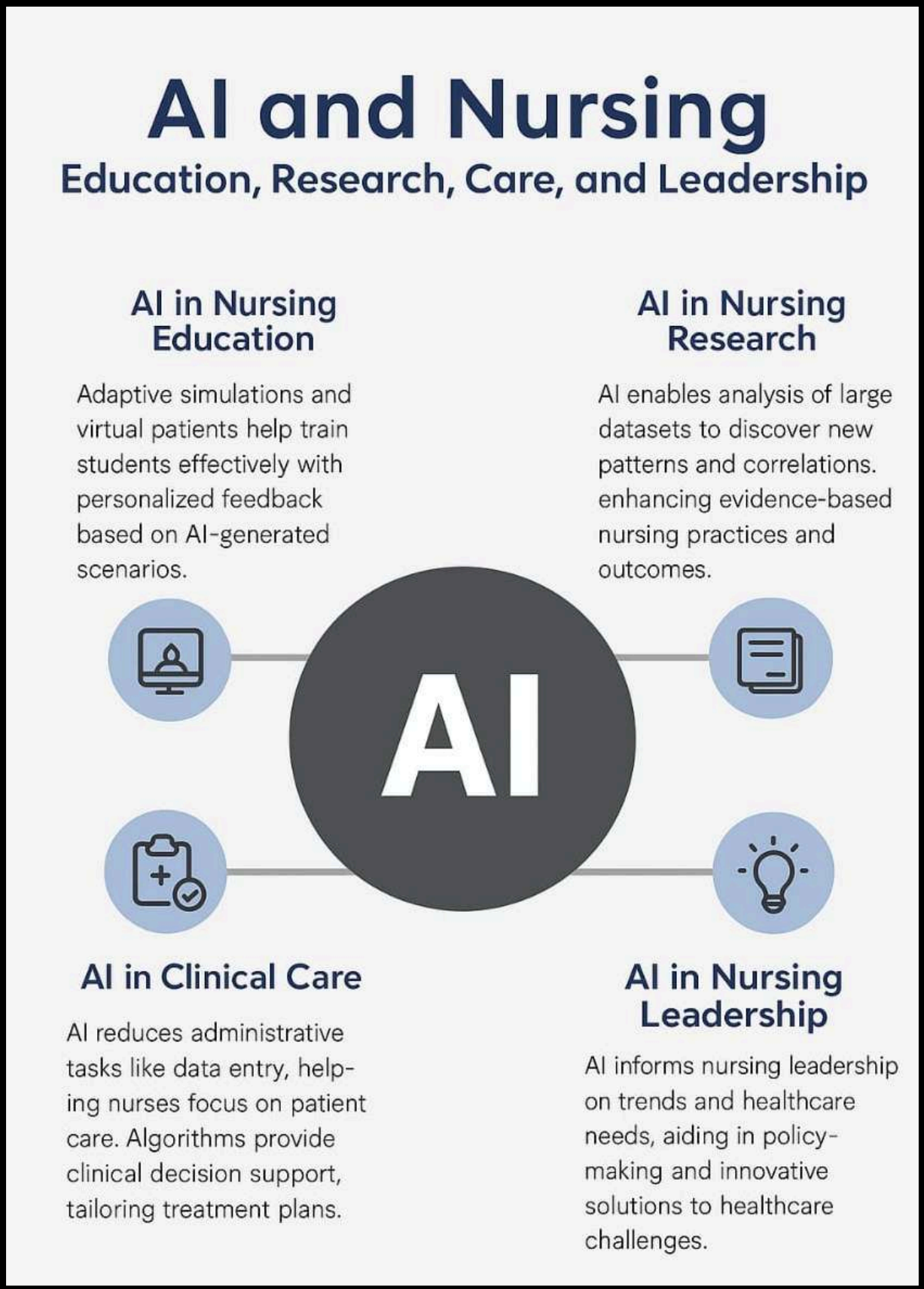
Poster Presented by Ms. Priyanka Sutar
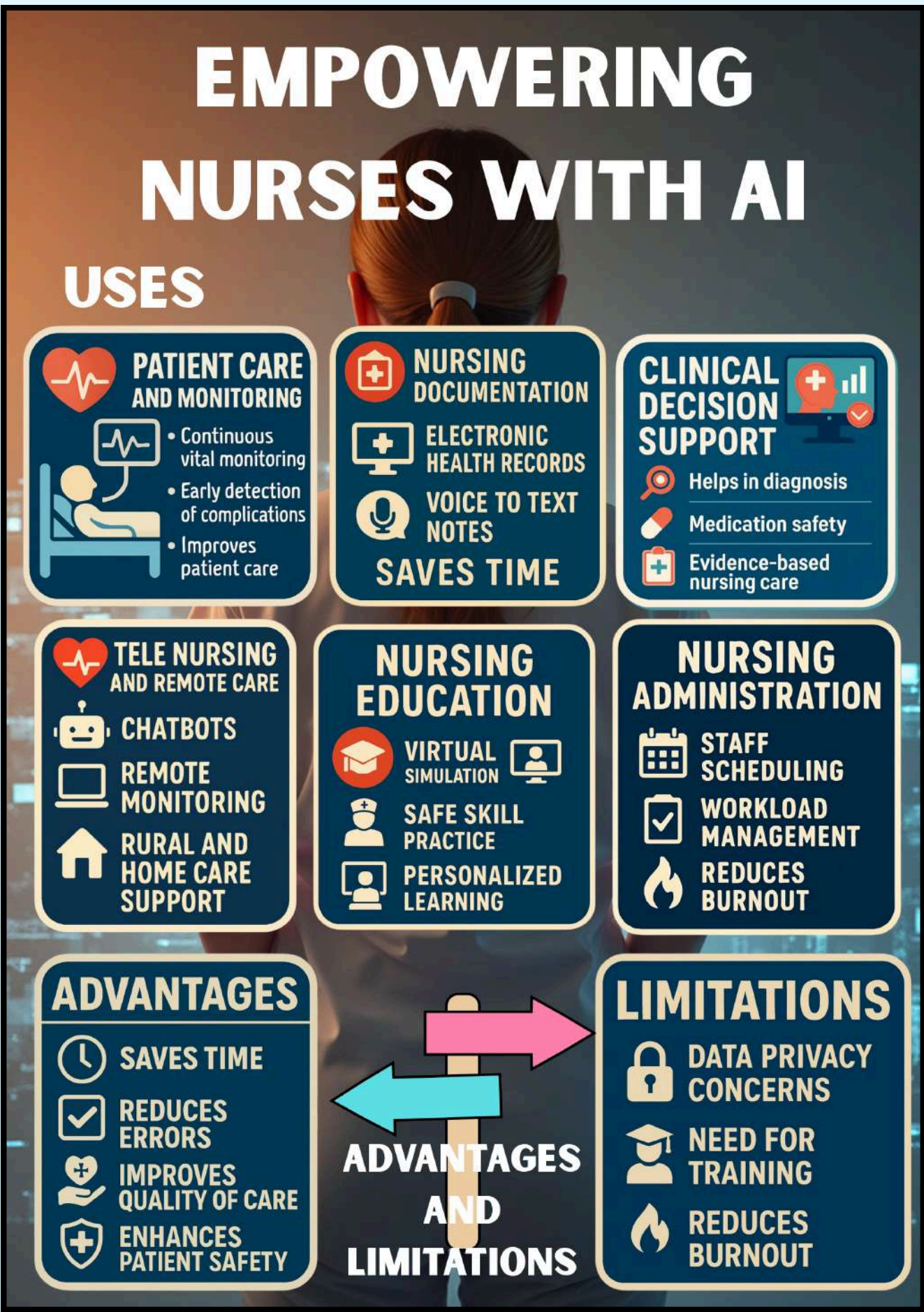
Poster Presented by Ms. Prerana Pawaskar
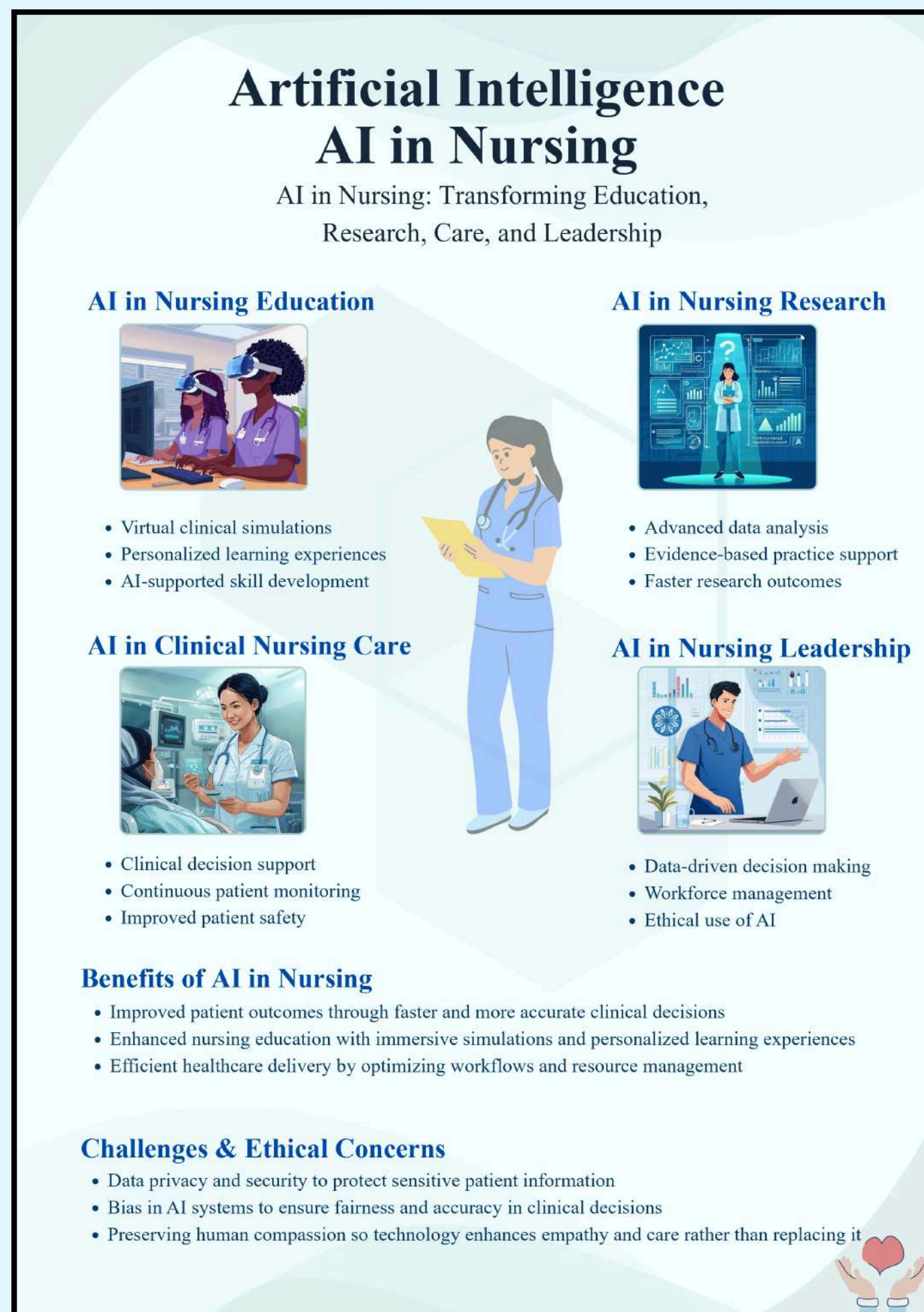
Poster Presented by Ms. Sakshi varpe and group

Poster Presented by Ms. Sakshi Bahir

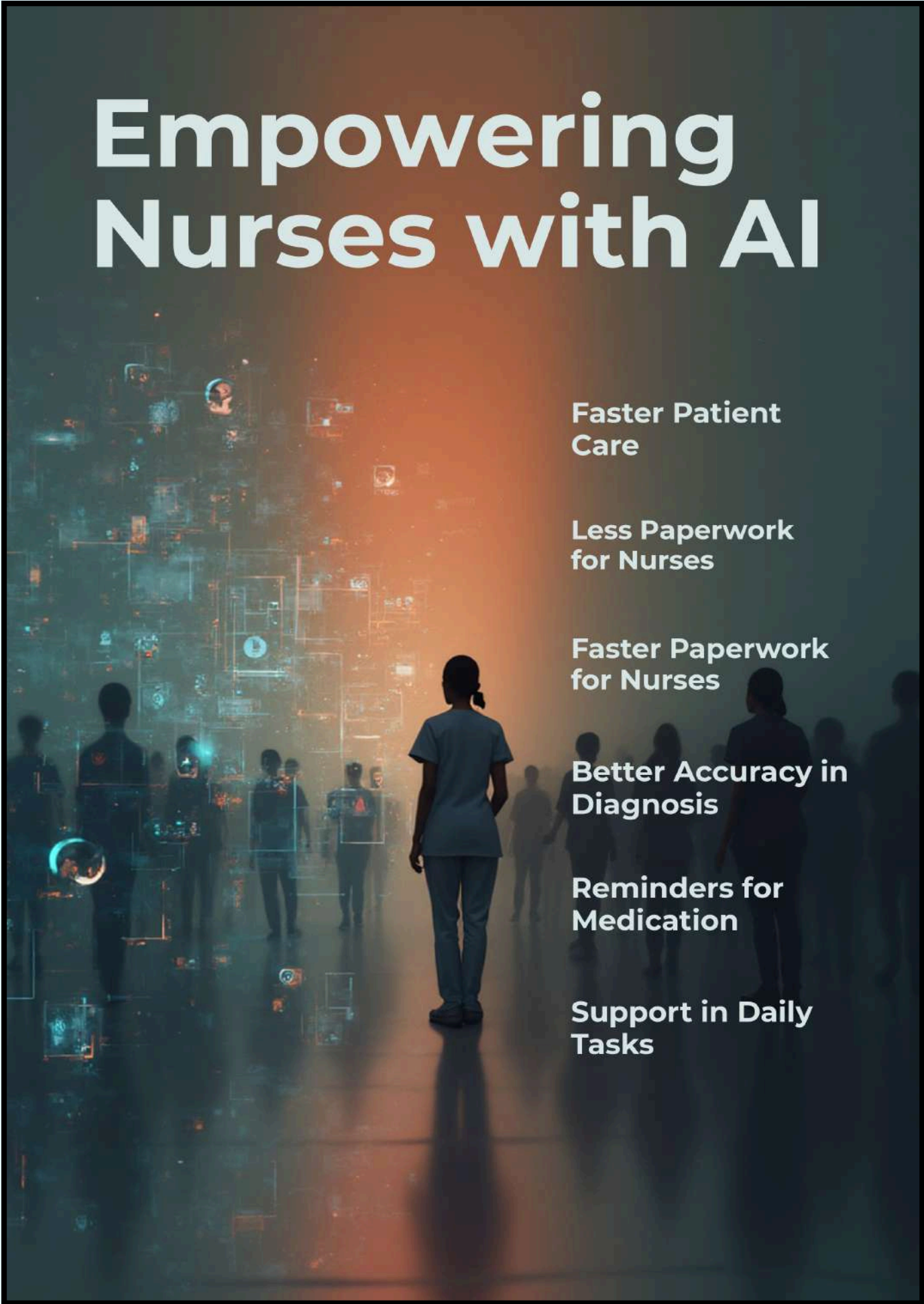## Poster Presented by Ms. Vedangi Patil and group

Poster Presented by Ms. Shradhha Shantaram Khopade

Poster Presented by Minhaj Mullha and group

Poster Presented by Ms. Priyanka Sutar

Poster Presented by Ms. Sakshi Shelar

The International Conference **"AI and Nursing: Education, Research, Care and Leadership"** **r**eceived a total of 10 research abstract/ paper submissions. After the review process, all accepted papers will be published in the Nursing Innovators Journal. These contributions reflect current research trends and provide valuable insights for researchers and practitioners.

MKSSS BTINE

MAHARSHI KARVE STREE SHIKSHAN SAMSTHA'S
SMT. BAKUL TAMBAT INSTITUTE OF NURSING EDUCATION
KARVENAGAR, PUNE-411052

E-mail:- btine@maharshikarve.org

Phone: +918847788190, +917499332095 Website

www.mksssbtine.ac.in