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ขอส่งสำเนาบันทึกข้อความที่ 1306-1307/2568

1 ข้อความ

Documentation Chiangrai College <documentation@crc.ac.th>

4 ธันวาคม 2568 เวลา 11:30

ถึง: Nursing Chiangrai College <nursing@crc.ac.th>

เอกสารแนบ 2 ฉบับ

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 **1307(11)แบบรายงานการเข้าร่วมประชุม อ.ดุขฎิ.pdf**
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รองคณบดีฝ่ายบริหาร



วิทยาลัยเชียงราย

สำนักอธิการบดี
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 รหัส: 1309 (ท)/๒๕๖๘
 25 พ.ย. 2568 เวลา 11:48
 ผู้รับ: อ.นพ

แบบรายงานการเข้าร่วมประชุม / สัมมนา / ฝึกอบรม / ศึกษาดูงาน

ชื่อ-สกุล ร.ล. อรุณี กิจจธนาพร	ตำแหน่ง : ผู้อำนวยการศูนย์ (เตรียมพร้อม)
หน่วยงาน : กองพัฒนาศึกษาในต่างประเทศ	กองพัฒนาศึกษาในต่างประเทศ วิทยาลัยเชียงราย
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เรื่อง	The 5th International Nursing and Health Science Conference
หน่วยงานที่จัด	คณะพยาบาลศาสตร์ มหาวิทยาลัยราชภัฏวชิรเวศน์
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สรุปสาระสำคัญ	(6๐๐-๖๕๐)
ประโยชน์ที่ได้รับ	1. ได้รับองค์ความรู้ใหม่เกี่ยวกับ Digital Health และ Global Health Challenges ครอบคลุมด้านสุขภาพ 2. ได้เพิ่มพูนความรู้ความเข้าใจเกี่ยวกับเทคโนโลยี AI and Generative AI ในวงการสุขภาพ 3. ได้เรียนรู้เกี่ยวกับ Digital Health Literacy ในยุคดิจิทัล , ได้ทราบถึงแนวคิดเกี่ยวกับ Super-Aged Society 4. ได้เรียนรู้เกี่ยวกับ Digital Mental Health และ Digital Health ในบริบทของ Telehealth และ mHealth 5. ได้เรียนรู้เกี่ยวกับระบบสารสนเทศสุขภาพและองค์ความรู้เกี่ยวกับ Digital Home 6. ได้ทราบถึงองค์ความรู้เกี่ยวกับนวัตกรรมทางการแพทย์และสาธารณสุข ในระดับสากล
แนวทางในการนำความรู้ที่ได้รับมาปรับปรุงการทำงาน	

หัวข้อการปรับปรุง/พัฒนา	หมายเหตุ
1.) พัฒนาซอฟต์แวร์โดย AI / โมเดลปัญญาประดิษฐ์ 2.) เพิ่มการใช้ Generative AI / Simulation ในการ ฝึกซ้อมและการประเมินผล 3. ทักษะด้าน Health Literacy ของบุคลากร การสื่อสารกับประชาชน	

เอกสารที่แนบมาด้วย

1. วัตถุประสงค์ของโครงการ
2. ระยะเวลาโครงการ = 1 ปี
3. งบกลาง/ค่าเช่าอาคาร

ศาสตราจารย์ ดร. พิชรินทร์ เงินทอง

ผศ.ดร. พิชรินทร์ เงินทอง

กรมส่งเสริมการค้าระหว่างประเทศ

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 25/11/68

ความคิดเห็นของรองอธิการบดี ฝ่ายบริหาร ฝ่ายวิชาการ ฝ่ายกิจการนักศึกษา

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 23 ธ.ค. 2568

รับทราบ
 ผศ.ดร. พิชรินทร์
 วันที่ 25/11/68



The 5th International Nursing and Health Sciences Conference Program
5th, 7th November 2025
at Pullman Khon Kaen Raja Orchid Hotel
Khon Kaen Province, Thailand

Datetime	Program
Day 1 November 5, 2025	
Orchid Ballroom 1-2	
07.30 – 08.30 am	Registration
08.30 – 09.00 am	Opening Ceremony <ul style="list-style-type: none"> ○ Cultural performance ○ Ceremony opening reported by Dean, Faculty of Nursing, KKU ○ Opening Inauguration & Welcome address by Chairman of the University Council, Khon Kaen University, Thailand
09.00 – 09.30 am	Featured presentation “Digital Innovation and Global Health Challenges” <ul style="list-style-type: none"> ○ <i>Dr. Athaporn Limpanyaklers, Deputy Secretary General, National Health Security Office, Thailand</i>
09.30 – 09.50 am	The Special presentation “The Digital Transformation of Nursing Education: A roadmap for KKU Smart Nurses” <ul style="list-style-type: none"> ○ <i>Associate Professor Dr. Ampornpan Theeranut, Dean of Faculty of Nursing, Khon Kaen University, Thailand</i>
09.50 – 10.10 am	Refreshment
10.10 – 11.00 am	Keynote Presentation 1: “Social Robots and The Super Aged Society” <ul style="list-style-type: none"> ○ <i>Professor Dr. Wendy Moyle, School of Nursing and Midwifery, Griffith University, Australia</i>
11.00 – 12.00 pm	Keynote Presentation 2: “Health Literacy in the Digital Age – Building on the Past to Shape the Future” <ul style="list-style-type: none"> ○ <i>Professor Dr. Don Nutbeam, Executive Director of Sydney Health Partners, Profession of Public Health, Sydney School of Public Health, University of Sydney, Australia</i>
12.00 – 01.00 pm	Lunch
01.00 – 02.15 pm	Keynote Presentation 3: “Digital Mental Health: Shaping a Healthier Tomorrow” <ul style="list-style-type: none"> ○ <i>Professor Sally Chan, Co-Director of TRC-DMH, President of Tung Wah College, Kowloon, Hong Kong (Virtual Keynote Speaker)</i> ○ <i>Professor Roger Ho, Professor and Senior Consultant Psychiatrist, Department of Psychological Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore</i> ○ <i>Asst. Prof. Dr. Ho Su Hui, Cyrus, Department of Psychological Medicine, National University of Singapore</i> ○ Moderator: <i>Professor Dr. Patraporn Bhatarasakoon, Director of the Thailand Centre for Evidence Based Healthcare: A JBI Excellent Center, Faculty of Nursing, Chiang Mai University, Thailand</i>
02.15 – 03.00 pm	Keynote Presentation 4: The Future of Nursing in a Digital Health Era: Telehealth and mHealth Trends <ul style="list-style-type: none"> ○ <i>Assistant Professor Dr. Nada Lukkahatai, Director of the MSN (Entry into Nursing) Research Honors Program, School of Nursing, Johns Hopkins University, USA</i>
03.00 – 03.15 pm	Refreshment
03.15 – 03.45 pm	Exhibition Sponsors Upright Company “Transforming Healthcare Education through Generative AI Simulation” by Mr. Louis Teo, Sale Director, Asia Pacific
03.45 – 04.30 pm	Concurrent Session 1 : “Utilization Generative AI for Healthcare : Workshop” <i>Assoc. Prof. Dr. Kanda Saikaew, Deputy Director of Khon Kaen University Library for Digital and Technology Innovation and Team</i>
Orchid Ballroom 3, Chattan1-2, Erawan 1-2	
03.15 - 04.30 pm	Poster presentation
06.30 – 09.30 pm	Sithan KKU Festival (Loi Krathong)
Day 2 November 6, 2025	
Orchid Ballroom 1-2	
08.30 – 09.00 am	Registration
09.00 – 10.00 am	Keynote Presentation 5: Digital Utilization in Simulation – based Nursing Education and Profession <i>Clinical Assistant Professor Dr. John Knight, School of Nursing, University of Michigan, USA</i>
10.00 – 10.15 am	Refreshment
10.15 – 12.00 pm	Plenary Session 1: Policy, Ethic and Security in Digital Health <ul style="list-style-type: none"> ○ <i>Clinical Professor Dr. Lauretta Quinn, School of Nursing, University of Illinois Chicago, USA (Virtual Keynote Speaker)</i> ○ <i>Dr. Araya Khaimook, MD., Director of Information and Communication Technology Center, Office of the Permanent Secretary, Ministry of Public Health, Thailand</i> Moderator: <i>Assistant Professor Donwivat Saansom, PhD, RN, Director of the Adult Nursing Department, Faculty of Nursing, Khon Kaen University, Thailand</i>
12.00 – 01.00 pm	Lunch
01.00 – 02.00 pm	Keynote Presentation 6: Digital Technology in Disaster Management <ul style="list-style-type: none"> ○ <i>Assistant Professor Dr. Mayumi Negishi, School of Nursing, University of Shizuoka, Japan</i> ○ <i>Associate Professor Dr. Fitri Arofiati, School of Nursing, Faculty of Medicine, Universitas Muhammadiyah Yogyakarta, Indonesia</i> Moderator: <i>Associate Professor Dr. Hathaichanok Buajaroen, Lecturer of Community Nursing Department, Faculty of Nursing, Nakhon Pathom Rajabhat University.</i>

Date/time	Program
02.00 – 03.30 pm	Concurrent Session 2: Digital Mental Health in Action: Evidence, Innovation, and Impact <ul style="list-style-type: none"> ○ <i>Prof.Dr.Patraporn Bhatarasakoon, Director of the Thailand Center for Evidence Based Healthcare: A JBI Excellent Center, Faculty of Nursing, Chiang Mai University, Thailand</i>
03.30 – 03.45 pm	Refreshment
03.45 – 05.00 pm	Concurrent Session 3: AI Application in Nursing Research & Practice <ul style="list-style-type: none"> ○ Exhibiting Sponsor "Innovating Medical Training through High-Fidelity Simulation by Mr.Ranon Dolruedej, Sales & Marketing Director, 4D Company (30 minutes) ○ Toward Precision Psychiatry: Functional Near- infrared Spectroscopy and Machine Learning for Depression Diagnosis and Treatment Prediction by Asst.Prof.Dr. Ho Su Hui, Cyrus, Department of Psychological Medicine, National University of Singapore (20 minutes) ○ Application of digital health technology in chronic disease management at primary health care institutions; taking diabetes and hypertension management as examples by Professor Dr. Zhang Lifang, Dean of Faculty of Nursing, Youjiang Medical University for Nationalities, China (30 minutes)
02.00 – 03.30 pm	Oral presentation (Chattan 1-2, Iyara, Erawan 1-2)
03.30 – 03.45 pm	Refreshment
03.45 – 05.00 pm	Oral presentation (Cont.) (Chattan 1-2, Iyara, Erawan 1-2)
06.30 – 09.00 pm	Gala Dinner (Orchid Ballroom 1-2)
Day 3 November 7, 2025	
Orchid Ballroom 1-2	
08.30 – 09.00 am	Registration
09.00 – 10.30 am	Plenary Session 2: Innovative Approaches to Health Science Research & Services <ul style="list-style-type: none"> ○ <i>Associate Professor Dr. Theerawat Wilaiprasitporn, Vidyasirimedhi Institute of Science and Technology (VISTEC), Thailand</i> ○ <i>Associate Professor Dr. Cherdchai Nopmaneejumruslers, Faculty of Medicine, Siriraj Hospital, Mahidol University, Thailand</i> ○ <i>Mr.Tian Junhong, (Digital health in wound care ostomy care), Director of Zhounghua Community Health Service Center, Guiyang, China</i> ○ Moderator: <i>Assistant Professor Dr. Thitipong Tankumpuan, Associate Dean for Research, Faculty of Nursing, Mahidol University, Thailand</i>
10.30 – 10.45 am	Refreshment
10.45 – 11.30 am	Keynote Presentation 7: Nursing Values in Digital Healthcare System <ul style="list-style-type: none"> ○ <i>Associate Professor Dr. Suchitra Luangamornlert, President of the Thailand Nursing and Midwifery Council (Virtual Keynot Speaker)</i> ○ <i>Associate Professor Dr.Prakin Suchaxaya, Coordinator Health Programs, WHO Country office for India.</i> ○ Moderator: <i>Assoc.Prof.Dr.Kittikorn Nilmanat, Chair or Ph.D. Program, Faculty of Nursing, Prince of Songkla University</i>
11.30 – 11.45 am	Award ceremony and Certificate Distribution
11.45 – 12.00 pm	Closing Ceremony
12.00 – 01.00 pm	Lunch



CERTIFICATE OF ATTENDANCE

This certificate is proudly presented to

Miss Dussadee Konartorn

has successfully attended the 5th International Conference on
Digital Health and Innovation in Nursing and Health Science:
Shaping a Healthier Tomorrow and Global Sustainability

November 5-7, 2025, Khon Kaen, Thailand

Assoc. Prof. Dr. Ampornpan Theeranut

Dean, Faculty of Nursing, Khon Kaen University

A Comprehensive Report on Digital Health Transformation: AI, Smart Hospitals, and Community Care

Executive Summary & The Technological Imperative

This report synthesizes key insights from the November 7, 2025, panel discussion, focusing on the strategic integration of Artificial Intelligence (AI) and digital technologies to transform healthcare delivery, manage an aging population, and optimize hospital operations. The core philosophy driving this transformation is that **digital health is a tool to achieve better public health, not the end goal itself**, requiring a **human-centric approach** that prioritizes ethical frameworks and frontline engagement.

Pillars of Digital Health Transformation

The successful transition to a digital healthcare ecosystem rests on three interconnected pillars: **Policy, Ethics, and Security**. Panelists emphasized that while these are equally important, **Ethics may be the most crucial** for long-term sustainability, ensuring that fundamental values guide technological deployment.

Advancements in AI and Neuroengineering

AI is a critical enabler of both clinical excellence and operational efficiency. In the field of neuroengineering, AI has shown transformative potential:

- **Diagnostic Efficiency:** AI algorithms can significantly reduce the time required for complex diagnostics. For instance, AI can assist physicians in reading **Electroencephalography (EEG)** for seizure detection and sleep staging, cutting analysis time from 7-8 hours to approximately 15 minutes, with reported accuracy reaching 80-90%.
- **Multi-Omics and Unsupervised Analysis:** Research extends to using AI in digital pathology with multi-omics data, unsupervised analysis of sleep, and AI co-pilots for nutrition teleconsultation.
- **Out-of-Hospital Monitoring:** Non-contact technologies, such as **Radar-based contactless sensing** for vital signs and dedicated **COVID-19 home isolation**

platforms, have extended the reach of clinical monitoring beyond the hospital walls, demonstrating technology's role in community-based care.

Smart Hospitals and Operational Excellence

The vision of the Smart Hospital is defined by achieving clinical and operational value through technological integration, rather than simply adopting technology for its own sake.

Smart Hospital Pillars and Value Proposition

A truly Smart Hospital focuses on three key areas:

1. **Clinical Excellence and Safety:** Leveraging technology to improve diagnostic accuracy and patient outcomes.
 2. **Operational Efficiency:** Optimizing internal processes to save costs and reduce waste.
 3. **Enhanced Experience:** Improving the professional satisfaction of staff and the journey of the patient.
- **The Primacy of Staff Convenience:** Experts argued that for digital transformation to be successful and sustainable, **the convenience of the staff must precede the convenience of the patient**. If technology burdens frontline personnel, adoption will fail, leading to burnout.
 - **AI for Operational Gains:** AI demonstrates immediate profitability in operational contexts. Examples include:
 - **Nurse Scheduling:** AI can rapidly create legally compliant and optimal nurse schedules in minutes.
 - **Inventory and Supply Chain:** AI can predict medication and supply needs with approximately 95% accuracy, significantly reducing wastage and shortage risks.
 - **Data Architecture for Interoperability:** Effective digital health requires seamless data flow. The integration of multi-modal data (EHR, imaging, genomics) must adhere to standards such as **Fast Healthcare Interoperability Resources (FHIR)** to ensure seamless and secure data exchange across different systems.

Ethical AI Governance and Data Sovereignty

The development and deployment of AI in healthcare require a robust ethical and regulatory framework to maintain public trust and ensure patient safety.

Ethical Governance Frameworks for AI

AI applications in clinical settings must be subjected to a rigorous ethical process akin to drug approval:

- **Mandatory Oversight:** AI development should pass through an **Institutional Review Board (IRB)** and require **Informed Consent** from patients whose data is used for training, as well as from those receiving care guided by the AI.
- **Transparency and Validation:** Transparency is crucial, demanding detailed clinical annotation of data by experts and open publication of results.
- **External Validation:** Before widespread clinical adoption, AI models must undergo **external validation** across various disease boundaries and demographic groups to ensure generalizability and prevent algorithmic bias.

Data Governance and Security

With health data being highly sensitive, stringent governance is required to manage security and sovereignty:

- **Data Sovereignty:** Thai law mandates that all health data must be stored in data centers **located within Thailand**, a policy that ensures national control without necessarily impeding the use of global cloud systems.
- **Federated Learning:** To mitigate the security and legal risks of moving highly sensitive data, techniques like **Federated Learning** are crucial. This allows AI models to be trained on data locally within each hospital's data center, with only the learning parameters being shared, thus protecting patient confidentiality.
- **Legal Accountability:** The Personal Data Protecting Act (PDPA) enforces strict liability for data breaches, with fines up to 5 million baht per case and clear executive accountability, establishing a strong deterrent.

The Digital Divide and Nursing's Transformative Role

While technology promises universal benefits, the "Digital Divide" creates health inequities that must be addressed through policy and targeted training.

Addressing Barriers to Access and Equity

- **Financial and Systemic Barriers:** The high cost of digital devices remains a major obstacle. Policy intervention, such as making digital health tools eligible for **reimbursement from the National Health Security Office (NHSO)**, is necessary to promote equitable access. Systemic issues like the lack of universal broadband internet access in rural areas must also be resolved.
- **Psychosocial Barriers:** Patients often face **technology illiteracy** and **'technology fatigue'**—the exhaustion caused by constant device interaction and alerts.
- **User Inclusion:** To overcome these barriers, the design process must incorporate **potential users** from under-represented, low-income, and marginalized communities throughout the entire development lifecycle, ensuring technologies are intuitive and relevant.

The Evolving Role of Nursing in Digital Health

Nurses are the crucial link between technology and the patient, yet their involvement is often overlooked.

- **Bridging the Implementation Gap:** A major barrier to successful technology integration is the **lack of nurse engagement** in the decision-making process. To mitigate staff resistance and prevent burnout, organizations must utilize **Design Thinking and System Thinking** principles, actively involving frontline staff to co-design and implement new digital workflows.
- **New Value Frameworks:** In the digital age, core nursing values (compassion, advocacy, human dignity) must be redefined for telehealth and digital contexts. Nurses require training to **see the person behind the data** and develop the skills for virtual patient assessment.

Strategic Models and Conclusion

The successful future of digital health depends on scaling effective, safe, and ethically sound models of care into the community.

The Internet-Plus Home Nursing Model

This model extends high-quality, specialized care into the homes of patients, a necessity for aging societies.

- **Specialized Home Care:** Platforms (e.g., Wunijia in China) deliver specialized nursing services (such as diabetic foot care, ostomy care) via structured digital workflows.
- **AI in Home Care:** AI is used for clinical assistance, such as **wound measurement and assessment** via mobile applications.
- **Building Trust:** The model addresses patient fear of technology by implementing a **simple User Interface (UI)** and ensuring that the initial interaction is an in-person, hands-on demonstration by the nurse to establish trust before transitioning to remote guidance.

Preparing the Workforce and Systems

- **Disaster Nursing Education:** Technology is essential for training in areas with geographic complexity (e.g., Indonesia). **Virtual Reality (VR) and Simulation** training allow students to gain necessary clinical experience in disaster scenarios without physical travel.
- **Final Strategic Imperative:** The ultimate success of digital transformation hinges on securing the **human-centric foundation**. This involves:
 1. **Mandating Ethics and Literacy:** Integrating digital ethics and literacy into all levels of healthcare education and practice.
 2. **Ensuring Nurse Leadership:** Placing nurses in leadership positions to drive and govern digital initiatives.
 3. **Prioritizing Safety:** Training staff to be advocates for safe implementation, recognizing that new digital systems introduce risks like data breaches.

สรุปสาระสำคัญในการประชุม 5-7 พฤศจิกายน 2568

International Conference Lectures on Social Robotics, Digital Health Literacy, and the Future of Nursing in Digital Health

The rapid digital transformation of global health systems has marked a turning point in how healthcare is delivered, accessed, and experienced across countries. While population aging, the burden of chronic illnesses, and shortages of healthcare workers continue to intensify worldwide, technological advancements—such as artificial intelligence (AI), wearable devices, telehealth, mobile health (mHealth), and social robotics—are emerging as essential solutions to support sustainable and equitable healthcare. The lectures analyzed in this report provide a comprehensive overview of innovative approaches to elderly care, digital health literacy, personalized symptom management, and the evolving competencies required in the future workforce of nursing and health sciences.

This five-page academic summary synthesizes and critically integrates key concepts, evidence, and implications from three major lecture themes:

- (1) **Social Robotics in Elderly Care,**
- (2) **Digital Health Literacy in the Age of AI,** and
- (3) **The Future of Nursing in Digital Health,** including telehealth, mHealth, wearable-supported care, and hybrid service models.

The purpose of this conference is to:

1. Summarize essential knowledge delivered by international experts.
2. Identify significant trends and challenges shaping digital healthcare ecosystems.
3. Highlight implications for healthcare workforce development, nursing practice, and health policy.
4. Provide forward-looking recommendations for integrating this knowledge into education, research, and clinical practice.

Social Robotics in Elderly Care: Evidence, Co-Design, and Application

1. Global Aging and Systemic Pressures Professor Wendy Moyle emphasized that global demographic changes, especially the rapid expansion of the population aged 65 years and older, pose unprecedented social and economic pressures on health and long-term care systems. According to United Nations projections cited in the lecture, the world will have **1.7 billion older adults by 2054**, with Asia experiencing the steepest demographic shift. This transition creates increasing demands for formal caregivers, specialized dementia care, and

cost-effective technological innovations capable of enhancing quality of life while mitigating staff shortages and escalating healthcare costs.

2. Social Robots as Supportive Tools for Elderly Care Social robots are designed to support—not replace—human caregivers by providing meaningful engagement, cognitive and emotional stimulation, companionship, communication enhancement, and remote telepresence. Their applications include:

- Behavioral and psychological symptom management among individuals with dementia.
- Pain and anxiety distraction during medical procedures.
- Exercise encouragement and activity monitoring.
- Remote family communication, especially beneficial in long-term care facilities.
- Promoting routine, reassurance, and social interaction.

The lecture highlighted the importance of realistic expectations: robots do not solve fundamental system shortages but augment care delivery in specific, evidence-supported ways.

3. Evidence from Clinical Trials One of the strongest evidence bases exists for **PARO**, the therapeutic seal robot. A rigorous **cluster randomized controlled trial** involving 28 care homes and more than 450 participants demonstrated:

- Higher engagement and observed pleasure.
- Reduced agitation and restlessness.
- Increased family involvement and improved intergenerational emotional connection.
- Feasibility of short, repeated intervention protocols (15-minute sessions, 3 times per week).

These findings underscore the potential of social robots as non-pharmacological interventions in dementia care, complementing behavioral strategies and environmental modifications.

4. Co-Design and Implementation Challenges A central theme was the necessity of **co-design with older adults, caregivers, and health professionals**. Insights from Griffith University's Social Robotics Laboratory reveal that technology adoption fails when systems are designed without deep engagement from end-users. Successful implementation requires identifying:

- Environmental constraints (space, noise, staffing levels).
- Cost considerations (with noted caregiver willingness-to-pay around 1,500 AUD).
- Usability concerns, particularly for people with cognitive impairment.
- Cultural perceptions of robots.
- Training needs for nurses and caregivers.

Several market failures were analyzed, such as the discontinuation of PEPPER due to poor alignment with healthcare needs, reminding stakeholders that technological capability alone does not guarantee adoption or impact.

Digital Health Literacy in the Age of AI

1. Conceptual Framework Professor Don Nutbeam expanded the traditional definition of health literacy to a modern paradigm that encompasses both **personal abilities** and **environmental demands**. Digital Health Literacy (DHL) includes the capacity to:

- Access and navigate digital information.
- Understand and evaluate content quality.
- Use digital tools for health management.
- Perform critical appraisal in environments saturated with misinformation and AI-generated content.

DHL must therefore be conceptualized as an interaction between individual, community, and system-level factors.

2. Opportunities of Digital Technology

Digital tools—including websites, apps, AI-driven decision aids, and multilingual large language models—can enhance health communication and empower individuals by:

- Simplifying complex medical information into readable forms.
- Providing 24/7 access to multilingual, personalized guidance.
- Supporting self-management of chronic conditions.
- Reducing disparities related to geography and mobility.

Examples include tools for simplifying discharge instructions, facilitating medication literacy, and promoting preventive health behaviors.

3. Risks, Misinformation, and Ethical Challenges

While AI expands accessibility, it also introduces risks:

- Algorithmic bias and content hallucination.
- Uneven digital access between urban and rural populations.
- Overreliance on individuals to verify online health information.

- Rapid spread of misinformation through social media.
- Misuse of generative AI for creating misleading or harmful content.

Nutbeam emphasized the need for **critical digital skills**, including frameworks like “**Trust It or Trash It?**” to encourage users to question:

Who said it? When? Why? What is the purpose?

4. Organizational and Policy-Level Solutions

Improving digital health literacy requires multilevel strategies:

1. **Accessible Information Environments** – redesigning digital interfaces to reduce cognitive load.
2. **Skill-Building Initiatives** – community workshops, school programs, and clinical education.
3. **Better Communication Practices** – plain language, multimodal formats, culturally relevant materials.
4. **Reform of Organizational Processes** – optimizing patient portals, signage, and institutional workflows.
5. **Regulation and Monitoring** – mechanisms to reduce misinformation and enhance digital safety.

Case studies from Western Sydney demonstrated the dramatic impact of culturally tailored communication campaigns, which increased vaccination uptake from below 40% to over 80% within three months.

The Future of Nursing in Digital Health: Telehealth, mHealth, and Hybrid Care

1. Evolution of Digital Health Professor Nanda provided a comprehensive historical outline of digital health:

- **1960s:** Early electronic medical record development.
- **1990s:** Internet expansion fueling widespread EMR adoption.
- **2000s–2010s:** Mobile technologies and wireless sensors.
- **2020 (COVID-19):** Rapid acceleration of telehealth and virtual care worldwide.
- **2021–2025:** Integration of AI-assisted decision systems, hybrid models of care, and data-driven nursing interventions.

2. Telehealth and mHealth: Definitions and Roles

Telehealth enables remote diagnosis, treatment, education, and monitoring through synchronous or asynchronous communication technologies.

mHealth utilizes mobile and wireless devices—such as smartphones, sensors, and wearable trackers—to collect real-time health data and enhance communication between patients and healthcare teams.

These technologies collectively support:

- Remote patient monitoring.
- Chronic disease management.
- Patient engagement and empowerment.
- Reduced travel burden for older adults and rural populations.
- Enhanced continuity of care and timeliness of interventions.

3. Personalized Digital Symptom Management (2014–2025)

Professor Nanda's decade-long research program integrates wearable data, ecological momentary assessment (EMA), home-based interventions, and iterative human-centered design. Key findings include:

- **Wearable Sensors:** Provide continuous activity and sleep data, revealing patterns not captured by weekly recall.
- **EMA:** Captures daily symptom fluctuations more sensitively than traditional assessments.
- **Home Interventions:** Combining exercise programs with auricular acupressure improved sleep, pain control, and activity levels among older adults.
- **Virtual Training:** Effective during COVID-19 and likely to remain central in hybrid models.
- **Biomarker Feasibility:** Sweat patch analysis and blood samples complement subjective data with physiological indicators.

Participants often reported that visualizing personal data motivated behavioral change, enhancing self-management capacity.

4. Practical Challenges in Digital Transformation

Major challenges identified include:

- High development and maintenance costs for digital platforms.
- Limited digital literacy among older adults and caregivers.
- Inconsistent internet access in rural areas.
- Data security, privacy concerns, and the complexity of regulatory compliance.
- Rapid technological changes requiring continual staff training.

- Preference among some patients for human contact rather than app-based communication.

Nevertheless, the potential for improved outcomes, earlier detection of symptom deterioration, and enhanced patient engagement is substantial.

Cross-Cutting Analysis and Implications

1. Intersection of Robotics, AI, and Nursing

The convergence of robotics and AI-enabled digital services highlights the growing need for nurses to be:

- Competent in digital health informatics.
- Skilled in interpreting and integrating sensor data.
- Engaged in co-design and evaluation of emerging technologies.
- Prepared to address ethical, privacy, and equity issues.

These competencies will be essential as healthcare shifts increasingly toward data-driven, home-based, and virtual models of care.

2. Workforce Development and Training

Nurses play a pivotal role as mediators between technology and human care. To maximize the benefits of digital transformation, education programs must:

- Incorporate digital literacy, AI ethics, and telehealth training.
- Promote interdisciplinary collaboration with engineers, data scientists, and IT specialists.
- Prepare nurses to lead implementation and evaluation of digital health innovations.

3. Policy and System-Level Considerations

Health systems should adopt policies that support:

- Ethical governance of AI tools.
- Equitable access to digital resources.
- Infrastructure for remote monitoring and hybrid care.
- Long-term evaluation of technology effectiveness and safety.
- Funding models that support sustainable digital integration.

Conclusion

The lectures collectively illuminate the transformative potential of social robotics, digital health literacy, telehealth, mHealth, and data-enabled personalized care. As the global population ages and digital technologies continue to advance rapidly, nursing and health systems must adapt through comprehensive workforce

development, responsible innovation, and patient-centered design processes. The evidence presented underscores that technology can enhance—but never replace—the human connection fundamental to nursing. Instead, digital tools serve as powerful extensions of clinical practice that, when implemented thoughtfully, can improve quality of life, expand access to care, reduce system burdens, and foster more equitable health outcomes.

The future of healthcare will be shaped by how effectively we integrate human compassion, technological innovation, and collaborative design. The insights from this conference provide a strong foundation for advancing nursing leadership, shaping ethical digital ecosystems, and developing sustainable models of care for diverse populations worldwide.

Digital Health and Technology in Diabetes Care: A Comprehensive Report

Executive Summary & The Technological Revolution in Diabetes Management

This report summarizes the key insights from the November 6, 2025, panel discussion on **Digital Health and Technology in Diabetes Care**. The discussion centered on leveraging technological advancements to achieve the World Health Organization's (WHO) 2030 global targets for diabetes. The core objectives include improving diagnosis rates, glucose and blood pressure control, and ensuring affordable access to insulin and monitoring devices. The panelists, which included a researcher, a nursing specialist, and a key administrator from the Thai Ministry of Public Health, emphasized that technology must be integrated using a **human-centric approach** as a supportive tool, not a replacement for clinical care. The most critical themes explored were the technological evolution toward the 'artificial pancreas,' the essential role of policy in ensuring equitable access, and the paramount importance of robust cybersecurity and data ethics.

The Technological Revolution in Diabetes Management

Diabetes technology has undergone a profound evolution over the past four decades, moving from primitive, cumbersome tools to sophisticated, real-time systems.

- **From Primitive to Precise:** Early care in the 1970s and 1980s relied on urinary glucose testing and painful lancet devices, one of which was nicknamed 'the guillotine'. This contrasted sharply with the modern era of compact, continuous monitoring.
- **The Landmark Trials:** A fundamental shift in care was driven by the 1993 DCCT (Type 1) and 1996 UKPDS (Type 2) trials, which definitively proved that **tight glucose control reduces major complications**. This evidence established the necessity of active glucose management.
- **Continuous Glucose Monitoring (CGM):** Modern CGM systems continuously measure real-time glucose levels, generating 280 to over 1440 readings per day. Data is transmitted wirelessly from the sensor to a smartphone, uploaded to a secure cloud platform, and can be integrated into electronic medical records. CGMs create a support network by enabling loved ones to monitor glucose levels in real-time.

- **Towards the 'Artificial Pancreas':** Insulin pump therapy has evolved from large, early devices to small, tubing-free contemporary pumps. The latest hybrid closed-loop systems automatically adjust insulin doses based on real-time glucose changes, marking a major step towards the ultimate goal: a fully closed-loop **artificial pancreas** that mimics the body's natural insulin regulation without manual user input.

Cybersecurity and Data Governance in the Digital Ecosystem

The rapid increase in connected medical devices and data exchange creates a complex and critical security landscape. The vast amount of data generated by CGMs, insulin pumps, and fitness trackers—including time-stamped glucose and insulin data, and biometric information—is considered the **second most valuable data** after financial data, making it a prime target for cyberattacks.

Key Cybersecurity Vulnerabilities and Collaborative Solutions

The integration of wireless technology in medical devices exposes patients and healthcare systems to risks such as unauthorized access, data manipulation, data loss, and malware.

- **Regulatory Response:** Addressing these vulnerabilities requires a collaborative effort involving manufacturers, clinicians, hospitals, and regulatory bodies. Regulatory organizations, such as the U.S. FDA, have issued pre-market guidance on medical device cybersecurity. Industry certifications, such as the IDE medical device cybersecurity certification, are also being developed and adhered to by stakeholders to establish robust security standards.
- **Data Vulnerability:** A key concern is that a security vulnerability in a medical device, such as a prior insulin pump flaw allowing alteration of insulin delivery, could have life-threatening consequences. The vulnerability of connected devices is a major issue because data is continuously shared across networks.

National Policy and Security Mandates (Thailand Focus)

Thailand's digital health policy is built on the three pillars of **Policy, Ethics, and Security**. Dr. Araya Kainu, Director of the Information and Communication Technology Center for the Thai Ministry of Public Health, outlined specific national mandates to ensure secure data sharing.

- **Mandatory Cybersecurity Standards:** All hospitals in Thailand must pass a specific cybersecurity metric (C-CAM) before they are permitted to share patient data.
- **Data Sharing Agreements (DSA):** Formal Data Sharing Agreements are a legal requirement when exchanging data with other organizations.
- **Legal Accountability:** The Personal Data Protecting Act (PDPA) enforces severe penalties for data breaches, with fines of up to 5 million baht per case and executive accountability.
- **Data Storage and Research:** Thai law mandates that health data must be stored in data centers located **within Thailand**. For research purposes, the most crucial policy is the **mandatory anonymization** of large datasets to protect individual privacy while enabling research.

The Ethical Challenge: Equity and the Digital Divide

Digital health technology, while offering tremendous benefits, presents a significant ethical challenge related to access and equity, known as the "**digital divide**". This divide leads to health inequity as access to advanced care remains unequal.

Multifaceted Barriers to Access

Barriers preventing equitable access to and use of advanced digital health technologies are numerous and fall into several categories.

- **Financial Barriers:** The high cost of devices and supplies is a major deterrent, even for those with insurance. In the Thai context, one speaker suggested making digital health tools eligible for **reimbursement from the National Health Security Office** as a solution to lessen access inequality.

- **System-Level Barriers:** These include insufficient provider time for patient education on new technologies and limited access for patients residing in rural areas.
- **Individual and Psychosocial Barriers:** Patients face technology illiteracy, self-care difficulties compounded by depression or anxiety, and physical discomfort from devices. 'Technology fatigue', caused by constant alarms and the burden of being tethered to a device, leads to high discontinuation rates.

Solutions for Equitable Integration

To ensure digital health technologies are effective and accessible for everyone, solutions must address both infrastructure and design.

- **User-Centric Design:** A critical recommendation is to **include potential users** from under-represented, low-income, and minority communities throughout the entire lifecycle of a device, from conceptualization to testing. Excluding end-users in the design process results in non-functional or inaccessible technology.
- **Infrastructure and Literacy:** Fundamental infrastructure issues, such as the lack of **universal broadband internet access**, must be addressed, as many digital solutions rely on this foundation. Furthermore, policy must actively work to prevent widening disparities by ensuring universal access, affordability, and **digital literacy** through training and education.
- **Ethics as the Core:** While policy, ethics, and security are all interconnected pillars, it was argued that **ethics is the most crucial for long-term sustainability** of digital health, as it ensures that the right things are done from the start.

Humanizing Digital Health: Nursing Practice and Patient Autonomy

Successfully integrating digital tools requires a careful focus on the human element, particularly the role of nurses and the preservation of patient autonomy over their personal health data.

The Nursing Perspective: Workflow and Burnout

Nurses are on the front lines of technology implementation, and a lack of involvement in the decision-making process is a major barrier to the effective integration of new digital health tools.

- **Barriers in Clinical Workflow:** Practical issues preventing effective integration include high workloads, frequent interruptions, a lack of dedicated training time, and non-intuitive systems that actually *increase* workload and contribute to provider burnout.
- **The Integration Imperative:** To successfully integrate digital tools and prevent increased workload and burnout, healthcare organizations must **involve nurses in the decision-making and implementation process**. A key insight from the panel was that technology should be viewed as a tool to *support* the patient, advocating for a **collaborative care model** that integrates healthcare providers with technology.

Addressing Patient Barriers to Technology Use

Nursing strategies must be developed to address the individual and psychosocial barriers patients face.

- **Distinguishing Real vs. Perceived Issues:** When patients express barriers to using technology, the first crucial step is to **distinguish between a real issue and a perceived one**. For a perceived issue, allowing the patient to try the equipment often helps overcome the barrier; for real issues (like true physical discomfort), alternatives must be found.
- **Collaborative Care for Psychological Factors:** For psychological barriers such as depression and anxiety, a collaborative approach is necessary, involving the provider, a nurse, and potentially a psychologist. The solution lies in the **integration of the provider with the technology**, not relying on technology alone.

Patient Autonomy and Data Consent

Protecting patient data rights and maintaining trust is directly linked to the principle of patient autonomy.

- **Clear, Transparent Consent:** Patient autonomy is achieved through clear, understandable, and transparent consent processes. These forms must detail exactly what is being done with their data.
- **The Right to Opt Out:** The process must go beyond a one-time signature. It requires providing patients with the continuous ability to **opt out at any time**. This is essential for reinforcing their autonomy and ensuring they feel comfortable with the security of the data platforms being used.

Strategic Policy Implementation and Conclusion

The successful, secure, and equitable implementation of digital health is predicated on a strong foundation of policy and legal frameworks. The discussion highlighted key policy actions required to govern national health data and promote public health.

National Digital Health Policy and Infrastructure

Effective policies are essential for enabling secure digital health. Thailand's national digital health action plan aims to create a national health information exchange and establish standardized data governance.

- **Connecting the Healthcare System:** The country is developing a national digital health platform to seamlessly connect all public, university, and private hospitals, allowing for the transfer of patient data across the country. This system views **trust as the "real currency"** of the digital health ecosystem, as the transfer of high-value health data cannot occur effectively without it.
- **Security for Sensitive Data:** For extremely sensitive information, such as psychiatric patient data, a higher level of security is required. Policy initiatives for this sector should classify the data as Critical Information Infrastructure (CII) and connect directly to security monitoring systems, while also adhering to advanced standards like ISO 20000.

Digital Health: A Tool, Not the Goal

The overarching principle reinforced by the panelists is that **digital health is a tool to improve public health, not the end goal itself**.

The primary objective remains to improve the health of the population. By focusing on the initial **human-centric approach**—ensuring ethical practices, addressing the digital divide, integrating the nursing perspective, and upholding robust security standards—technology can effectively serve as one of the means to achieve better public health outcomes.

