International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

"HUMAN TOUCH IN THE AGE OF AI: IMPLICATIONS FOR NURSING PRACTICE" – A RESEARCH ARTICLE

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Abstract:
The rapid integration of Artificial Intelligence (AI) into healthcare has driven significant advances in diagnostics, workflow efficiency, and clinical decision support. Despite these benefits, concerns arise regarding the potential erosion of the human touch — the relational, empathetic, and caring interactions that define nursing practice. This article examines the interplay between AI and human touch, reviews evidence highlighting touch as a core therapeutic component, and explores strategies to maintain compassionate care in digital healthcare settings. While AI can optimize technical processes and reduce clinician workload, the expressive, comforting, and therapeutic value of nurses' touch remains irreplaceable, directly influencing patient outcomes. Future models of care must balance technological innovation with human-centered approaches, ensuring empathy, communication, and physical presence are preserved. By integrating AI thoughtfully, nursing practice can enhance efficiency without compromising the essential human connection that underpins quality patient care.

INTRODUCTION

Healthcare is experiencing transformative shifts as artificial intelligence (AI) and machine learning become embedded in clinical workflows. Applications in diagnostics, predictive analytics, and administrative automation offer the potential for greater accuracy, efficiency, and streamlined care. However, the growing reliance on technology raises concerns about the possible devaluation of the human touch — the empathetic, relational, and tactile aspects central to nursing practice. Critics have noted that prioritizing algorithm-driven care for efficiency and throughput may inadvertently widen the gap between patients and caregivers, reducing meaningful personal interactions. In nursing, human touch extends beyond physical contact, encompassing emotional support, presence, and empathy that machines cannot replicate. This article reviews the nursing literature on touch, evaluates the impact of AI on nurse-patient relationships, and highlights evidence emphasizing the essential role of compassionate care. Preserving these human-centered practices is critical to ensuring holistic, patient-centered nursing in technologically advanced healthcare environments.

THE ROLE OF HUMAN TOUCH IN NURSING

Human touch remains a fundamental element of nursing and cornerstone of nursing's caring philosophy, integral to both clinical practice and compassionate care. It provides **therapeutic presence**, conveying reassurance and reducing patient anxiety, while supporting **emotional connection** through nonverbal expressions of empathy and solidarity. Physical touch also underpins **clinical assessment**, such as palpation and other tactile evaluations, essential for accurate patient care. Research consistently demonstrates that nurses' touch is irreplaceable, even in technologically advanced settings. As healthcare increasingly incorporates AI and automation, preserving the relational, empathetic, and tactile dimensions of nursing is critical to sustaining holistic, patient-centered care.

AI IN MEDICINE: EFFICIENCY VERSUS RELATIONSHIP

The integration of artificial intelligence (AI) into clinical medicine encompasses automated imaging analysis, predictive risk modeling, and administrative workflow automation. These technologies enhance efficiency and reduce the potential for human error; however, they may inadvertently limit direct clinician-patient interactions. Critics argue that prioritizing algorithm-driven care risks creating a system where efficiency supersedes individualized attention, potentially marginalizing patients who rely on empathetic support. Patient narratives reinforce this concern, highlighting frustration with impersonal, automated interactions and emphasizing the value of personalized explanations and reassurance from human caregivers. While AI effectively supports technical and administrative tasks, it cannot substitute for the therapeutic alliance established through human presence and relational care.

Balancing Technology and Empathy

Recent research underscores the necessity of integrating technological innovations with humanistic principles in healthcare delivery. AI applications, such as tele-nursing, predictive monitoring, and documentation automation, can enhance nursing efficiency without diminishing the importance of nurse-patient connection. Empathy, effective communication, and emotional support remain central, particularly in telehealth contexts where patients may experience isolation or anxiety. Effective AI integration requires:

- **Human-Centered Digital Models:** Ensuring AI enhances rather than replaces relational care.
- **Training and Guidelines:** Equipping nurses with digital competencies while maintaining compassionate practice.
- **Ethical Implementation:** Establishing policies that safeguard privacy, mitigate bias, and ensure equitable access without compromising human engagement.

RESEARCH EVIDENCE ON HUMAN TOUCH IN NURSING PRACTICE IN THE ERA OF ARTIFICIAL INTELLIGENCE

Author(s)	Year	Study Design	Focus of Study	Key Findings
1. Human Touch as an Irreplaceable Component of Nursing Care				
Airosa F, Arman M, Sundberg T, Öhlén J, Falkenberg T	2023	Qualitative synthesis	Nurses' experiences of touch in caring practice	Human touch was identified as an irreplaceable component of nursing care, essential for building trust, emotional security, and therapeutic relationships. Technology cannot substitute the emotional and relational value of touch.
Andrade L, Junges JR, et al.	2021	Qualitative study	Expression and reception of compassion through touch	Patients perceived compassionate touch as a powerful form of emotional support that reduced anxiety, vulnerability, and emotional distress, strengthening nurse–patient relationships.
Burgess JE, Gorton KL, Lasiter S, Patel SE	2023	Integrative review	Nurses' perceptions of expressive touch	Expressive touch enhanced communication, comfort, patient satisfaction, and nurses' professional fulfilment. Overuse of technology risks marginalizing this core nursing practice.
2. Therapeutic Touch and Physiological Outcomes				
Silva MM, Neto BS, Dourado-Marques RM,	2022	Conceptual analysis	Therapeutic touch in nursing care	Therapeutic touch was associated with pain reduction, anxiety relief, improved sleep, and emotional well-being, confirming touch as a distinct nursing intervention.

Pontífice-Sousa P				
Field T	2014	Narrative review	Physiological effects of human touch	Human touch was shown to reduce cortisol levels, lower blood pressure, and promote parasympathetic nervous system activity, supporting both psychological and physiological healing.
3. Artificial Intelligence in Nursing: Benefits and Limitations				
Ming LC, Ansari M, et al.	2024	Systematic review	Artificial intelligence applications in nursing	AI improved decision-making accuracy, early risk detection, and efficiency but lacked emotional intelligence, empathy, and the ability to provide therapeutic touch.
Matanukha S, Arifin MZ	2024	Integrative review	Impact of AI on nursing practice	Increased AI use raised concerns about reduced bedside interaction, increased screen time, and diminished caring behaviours such as touch and emotional presence.
Osman M, et al.	2024	Qualitative study	Perceptions of AI and robotic nurses	Nurses and patients acknowledged AI's efficiency but emphasized that empathy, emotional support, and human touch cannot be replicated by machines.
4. AI, Tele-Nursing, and Human Connection				
Das S, et al.	2025	Observational study	AI-assisted tele-nursing and patient satisfaction	AI enhanced monitoring and accessibility; however, patient satisfaction was significantly higher when nurses demonstrated empathy and human connection. Absence of physical touch was a major limitation.
Sauerbrei A, Kerasidou A, Lucivero F, Hallowell N	2023	Narrative review	AI impact on person-centred care	Excessive reliance on AI risked depersonalization of care. Human engagement and relational care must be preserved alongside technological advances.
5. Ethical and Professional Implications				
Harris R	2019	Commentary	Human touch in the age of AI	Warned that AI-driven healthcare may prioritize efficiency over empathy, risking erosion of human touch and compassionate care.
Saleh D, et al.	2025	Mixed-methods study	Nurses' attitudes toward AI	Resistance to AI adoption was linked to fear of losing meaningful human interaction, touch, and the caring essence of nursing practice.

Types of Human Touch in Nursing Practice, Theoritical Link and Impact of AI/Technology

Type of Touch	Definition	Examples	Theoretical Link	Impact of AI / Technology
Instrumental / Task-Oriented Touch	Touch used primarily to perform clinical or technical tasks. - Often brief and purposeful. - Essential for clinical care but may lack emotional intent unless combined with caring behaviours.	Checking pulse, administering injections, wound care.	Peplau: Part of therapeutic process. Watson: Can include caring when combined with presence.	AI can assist in monitoring, automated vitals, and robotic procedures, potentially reducing direct task-oriented touch but freeing time for expressive touch.
Expressive / Affective Touch	Touch intended to convey empathy, compassion, or emotional support. - Strengthens nurse–patient relationship - Closely aligned with Peplau's interpersonal phases and Watson's caring moments	Holding a patient's hand, gentle pat on the shoulder.	Peplau: Supports interpersonal phases. Watson: Caritas process, caring moment.	May be reduced in high-tech or telehealth settings; requires deliberate effort by nurses to maintain empathy in AI-supported care.
Therapeutic Touch	Deliberate, professional touch aimed at promoting comfort, relaxation, or healing. - Supported by evidence for reducing anxiety, pain, and stress. - Must be culturally sensitive and ethically appropriate	Massage, positioning, comforting touch during pain.	Peplau: Enhances exploitation phase. Watson: Carative process.	AI cannot replicate therapeutic touch; virtual guidance may assist nurses in timing or technique, but human intervention remains essential.
Protective Touch	Touch used to ensure patient safety or prevent harm. - Conveys reassurance and security when combined with communication	Assisting ambulation, guiding a confused patient.	Peplau: Facilitates trust and security. Watson: Ethical caring.	AI systems like fall detection, patient monitoring, and robotics can supplement safety but do not replace physical protective touch.
Caring / Intentional Touch	Mindful, conscious touch combined with presence, empathy, and compassion. - Reflects **Watson's Caritas Processes** and transpersonal caring	Touch with eye contact, verbal reassurance.	Peplau: Strengthens therapeutic relationship. Watson: Transpersonal caring.	At risk of being reduced if AI dominates workflow; requires conscious preservation of caring moments.

Social Touch	Culturally appropriate touch used for social interaction or greeting. - Requires awareness of personal boundaries and cultural norms.	Handshake, culturally accepted gestures.	Peplau: Supports relational trust. Watson: Can express respect and dignity.	Virtual care may limit social touch; alternative non-contact cues (smile, voice tone) may be emphasized.
Non-Contact / Perceived Touch	Touch conveyed symbolically or emotionally without physical contact. - Important when physical touch is limited (e.g., isolation, telehealth)	Eye contact, tone of voice, proximity.	Peplau: Enhances interpersonal connection when physical touch is limited. Watson: Caring through presence.	Becomes increasingly important in tele-health, remote monitoring, and AI-assisted communication where physical touch is not possible.

Unified Theoretical Model Integrating Watson's Theory of Human Caring and Peplau's Interpersonal Relations Theory in AI-Enabled Nursing Practice

This unified theoretical model conceptualizes nursing practice as a **humanistic–interpersonal caring process** supported by artificial intelligence (AI). Watson's Theory of Human Caring provides the **philosophical and ethical foundation of caring**, while Peplau's Interpersonal Relations Theory offers a **process-oriented relational structure** through which caring is enacted. Artificial intelligence is positioned as a **supportive, non-relational technological resource** that enhances — but does not replace — the nurse–patient relationship.

Assumptions of the Unified Model

1. Caring is the **essence of nursing** and cannot be automated.
2. Interpersonal relationships are the **mechanism through which caring is delivered**.
3. Artificial intelligence enhances technical efficiency but lacks moral, emotional, and relational capacity.
4. Optimal nursing outcomes occur when AI is **ethically integrated** to support caring and interpersonal processes.

Core Integration Logic

Watson's Theory	Peplau's Theory	Unified Interpretation in AI Context
Human caring science	Interpersonal nursing process	Nursing is both a moral–ethical and relational practice
Carative/Caritas processes	Phases of nurse–patient relationship	Caring values are enacted across relational phases
Transpersonal caring relationship	Therapeutic nurse–patient relationship	Healing occurs through authentic human connection
Caring moments	Orientation–Resolution phases	Each interaction is a potential healing moment

Holistic healing	Goal-oriented interpersonal growth	Care supports both health outcomes and personal growth

Structural Components of the Unified Model

1. Philosophical–Ethical Foundation (Watson's Theory)

This level represents the **core values and moral grounding** of nursing practices like

- ✓ Human dignity and wholeness
- ✓ Compassion, empathy, and intentional caring
- ✓ Transpersonal caring relationships
- ✓ Moral commitment to preserve humanity in care

Watson's theory ensures that all AI-enabled nursing practices remain anchored in **humanistic values**, preventing depersonalization of care.

2. Interpersonal Process Structure (Peplau's Theory)

This level operationalizes caring through **therapeutic nurse–patient interactions** across four phases:

Peplau Phase	Caring Expression (Watson)	Role of AI
Orientation	Establishing trust, presence, empathy	Provides clinical data and patient history
Identification	Understanding patient needs, emotional support	Supports assessment and risk identification
Exploitation	Therapeutic interventions and support	Assists monitoring and decision-making
Resolution	Growth, independence, closure	Supports follow-up and continuity of care

Peplau's theory provides the **relational pathway** through which Watson's caring values are enacted in practice.

3. Artificial Intelligence as a Supportive System

AI is integrated as a **non-human, non-caring agent** and includes

- ✓ Clinical decision support
- ✓ Predictive analytics
- ✓ Monitoring and alerts
- ✓ Documentation automation
- ✓ Tele-nursing platforms

AI supports **clinical efficiency and cognitive tasks** but does not participate in caring or interpersonal relationships.

4. Mediating and Moderating Factors

- influences how effectively caring and relationships are preserved in AI-supported environments like, Nurses' ethical sensitivity, Professional identity, Digital competence, Organizational culture, Time allocation for direct patient care and these factors protect the **integrity of caring science and interpersonal nursing**.

5. Caring–Interpersonal Outcomes – includes patient and nursing outcomes

Patient Outcomes

- Reduced anxiety and emotional distress
- Increased trust and satisfaction
- Enhanced sense of dignity and security
- Holistic well-being

Nursing Outcomes

- Professional fulfilment
- Ethical integrity
- Reduced burnout
- Strengthened caring identity

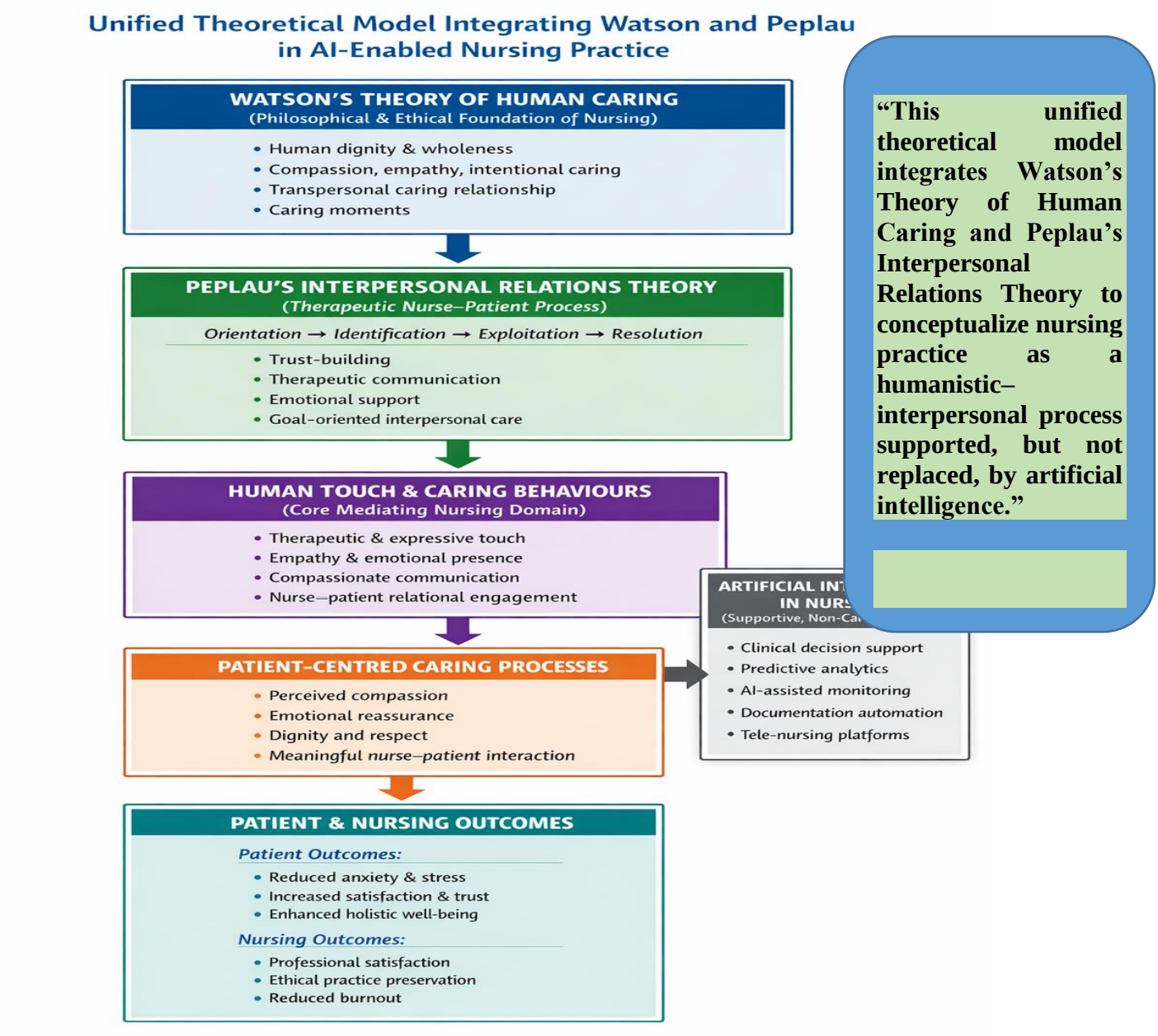

Figure 1. Unified theoretical model integrating Watson's Theory of Human Caring and Peplau's Interpersonal Relations Theory within AI-enabled nursing practice.

CONCLUSION

AI's integration into healthcare is reshaping clinical practice, offering opportunities to enhance diagnostic accuracy, efficiency, and decision support. However, the *human touch* — encompassing physical contact, presence, empathy, and relational communication — remains a cornerstone of nursing practice and holistic patient care. Nursing professionals must adapt to new technologies while safeguarding the therapeutic aspects of human interaction that machines cannot replicate. Future healthcare models should balance technological innovation with intentional strategies that preserve humanistic care. Ensuring that AI augments rather than displaces human touch will be critical to sustaining quality, compassionate nursing practice.

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