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# Understanding AI-mediated clinical communication during clinical placement: A theory-informed qualitative study of nursing students

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## Abstract

# Background

Artificial intelligence (AI), particularly large language models and AI-generated health information, is reshaping how patients access and interpret health information before clinical encounters. As patients increasingly enter healthcare with pre-formed understandings shaped by AI-mediated information, clinical communication is becoming more interpretive, relational, and complex. However, little empirical evidence has examined how nursing students experience and interpret these changing communication practices during authentic clinical placement. This study explored how nursing students experienced and interpreted AI-mediated clinical communication during clinical placement, guided by the concepts of interpretive authority, professional responsibility, and uncertainty communication.

# Methods

A theory-informed qualitative exploratory study was conducted with 32 Year 3 undergraduate nursing students undertaking surgical clinical placement at a university-affiliated teaching hospital. Participants completed structured reflective logs during placement and participated in facilitated post-placement reflective discussions. Data were analysed using reflexive thematic analysis.

# Results

Four themes were identified: (1) encountering AI-informed patient understanding; (2) negotiating patient understanding in clinical communication; (3) communicating uncertainty in nursing practice; and (4) reframing the communicative role of nurses. Participants described communication encounters shaped by AI-generated or digitally mediated information, highlighting challenges associated with differing interpretations, communicating uncertainty, and maintaining therapeutic relationships. Clinical communication was increasingly understood as an interpretive and relational aspect of nursing practice that extends beyond the transmission of clinical information.

# Conclusions

AI-mediated communication is reshaping patient understanding, clinical communication, and the communicative role of nurses in contemporary healthcare. Authentic clinical placement provided nursing students with opportunities to observe and interpret these changing communication practices, contributing to professional understanding of interpretive authority, professional responsibility, and uncertainty communication. These findings highlight the importance of preparing future nurses for the interpretive, relational, and communication demands of AI-mediated healthcare.

# Introduction

Artificial intelligence (AI), particularly large language models (LLMs), is increasingly influencing how patients access, interpret, and engage with health information[1–3]. AI-generated explanations are now widely available through chatbots, search platforms, and consumer-facing digital tools, enabling patients to obtain medical information before, during, or alongside professional consultation[3, 4]. Consequently, many patients enter clinical encounters with pre-formed understandings shaped by AI-generated or digitally mediated information[5, 6]. While these developments may improve access to health information, they are also changing how clinical communication unfolds, particularly in contexts characterised by complexity, risk, and uncertainty, such as surgical care[7, 8].

Clinical communication has long been recognised as a relational and interpretive component of nursing practice. Nurses play a central role in explaining medical information, contextualising uncertainty, supporting patient understanding, and maintaining trust throughout the care process[9, 10]. However, the growing availability of AI-generated health information is reshaping the conditions under which this communication occurs. Patients may now arrive with algorithmically informed interpretations of illness, treatment, risk, or prognosis that influence expectations, trust in professional advice, and responses to uncertainty[5, 11]. As a result, clinical meaning is increasingly co-constructed through interactions among patients, healthcare professionals, digital platforms, and AI systems rather than solely through professional communication[7, 8].

These developments are reshaping everyday nursing practice. Nurses increasingly encounter patients whose understandings have been influenced by AI-generated or digitally mediated information before consultation, requiring them to interpret patient perspectives, contextualise externally sourced information, negotiate differing understandings, communicate uncertainty, and maintain therapeutic relationships[9, 10, 12]. Such encounters may involve patients questioning professional explanations, holding strong expectations regarding treatment outcomes, or seeking clarification about conflicting information obtained from digital source[5, 8]. Rather than representing isolated communication difficulties, these situations reflect broader changes in how communication, patient understanding, and the professional role of nurses are enacted within contemporary healthcare[8, 11].

Recent theoretical work has conceptualised these changes through three interconnected dimensions of AI-mediated clinical communication: interpretive authority, professional responsibility, and uncertainty communication[13]. Interpretive authority describes the changing distribution of explanatory influence among healthcare professionals, patients, and AI systems. Professional responsibility emphasises the continuing accountability of healthcare professionals despite the growing influence of external algorithmic information. Uncertainty communication concerns the challenge of explaining probabilistic, evolving, or incomplete clinical knowledge when AI-generated information may appear more certain than clinical reality. Together, these dimensions provide a useful framework for understanding how AI-mediated information is reshaping clinical communication and the communicative role of nurses within contemporary practice[13].

Despite growing attention to AI in healthcare, relatively little empirical research has examined how AI-mediated clinical communication is experienced within routine nursing practice. Existing research has largely focused on AI as a technological innovation, educational resource, or clinical support tool rather than on how AI-mediated information changes everyday communication between patients and healthcare professionals[8, 14, 15]. Consequently, little is known about how nurses respond when patients arrive with AI-informed understandings, question professional explanations, expect certainty, or seek support in interpreting conflicting information. Likewise, limited evidence has explored how these changing communication practices are recognised and interpreted by nursing students during authentic clinical placement[7, 8, 16].

Clinical placement provides a unique opportunity to examine these changing communication practices. As novice participants in clinical care, nursing students occupy a distinctive position from which they can observe authentic interactions between patients and healthcare professionals while simultaneously developing their own understanding of nursing practice. During placement, students witness how nurses respond to AI-informed patient questions, negotiate differing interpretations, communicate uncertainty, and sustain therapeutic relationships in increasingly AI-mediated healthcare environments. These experiences offer valuable insight into how clinical communication is evolving in everyday practice and how future nurses begin to understand their professional role within these changing contexts.

Traditional communication training has often assumed that healthcare professionals remain the primary interpreters of clinical information, with communication largely viewed as the accurate transmission of information from professional to patient[17, 18]. However, in AI-mediated healthcare environments, patients increasingly enter clinical encounters with interpretations formed outside professional care settings[19]. Consequently, clinical communication extends beyond information delivery to include interpreting patient understanding, negotiating differing perspectives, communicating uncertainty, and maintaining trust despite increasing informational complexity[5, 10, 20].

These changes suggest that effective communication in contemporary nursing practice increasingly depends on interpretive judgement, relational engagement, and professional responsiveness rather than information transmission alone. Such demands are particularly evident in surgical nursing, where communication regarding risk, recovery, prognosis, postoperative outcomes, and uncertainty is central to safe, person-centred care[10, 19]. AI-generated or online information may reinforce patients' expectations of certainty regarding treatment and recovery, creating additional communication challenges when clinical realities remain uncertain. Observing these encounters allows nursing students to recognise how nurses interpret patient understanding, negotiate conflicting explanations, support emotional responses, and sustain therapeutic relationships within increasingly AI-mediated clinical environments[21].

Despite growing interest in AI within healthcare and nursing education, limited empirical research has examined how AI-mediated clinical communication is experienced during authentic clinical placement. Existing studies have primarily focused on AI education, digital competence, or simulation-based

learning rather than on students' observations of evolving communication practices in real clinical settings[22, 23]. Understanding these experiences is important because they provide insight into how AI-mediated information is reshaping nursing communication, professional responsibility, and the everyday practice of patient care.

This study aimed to explore how AI-mediated clinical communication was experienced and interpreted during authentic clinical placement from the perspective of nursing students. Guided by the conceptual dimensions of interpretive authority, professional responsibility, and uncertainty communication, the study examined how AI-generated or digitally mediated information influenced patient understanding, clinical communication, professional responsibility, uncertainty communication, and the evolving communicative role of nurses in everyday clinical practice[13].

To address this aim, we conducted a theory-informed qualitative study involving nursing students undertaking surgical clinical placement. Students participated in a brief pre-placement conceptual orientation, engaged in structured reflective inquiry during placement, and took part in facilitated post-placement group discussions. By examining students' reflections on authentic clinical encounters, the study sought to generate empirical insight into how AI-mediated information is reshaping clinical communication and nursing practice, and how these observations contribute to developing professional understanding during clinical placement (Fig. 1).

## Methods

# Study design

This study employed a theory-informed qualitative exploratory design to examine how AI-mediated clinical communication was experienced and interpreted during authentic clinical placement from the perspective of nursing students. Rather than evaluating communication competence, educational outcomes, or AI use, the study explored how students interpreted communication encounters in which patients' understandings appeared to be shaped by AI-generated or digitally mediated health information (Fig. 2)[24–26].

The study was informed by the conceptual dimensions of interpretive authority, professional responsibility, and uncertainty communication, which served as a sensitising framework for exploring participants' interpretations of AI-mediated clinical communication[13]. Consistent with a reflexive qualitative approach, the analysis focused on communication encounters involving competing interpretations, professional responsibility, uncertainty, and the evolving communicative role of nurses within increasingly AI-influenced healthcare environments[24–26].

Clinical placement provided an appropriate setting because nursing students occupy a transitional position between learner and future practitioner. Although they are not primarily responsible for patient care, they are well positioned to observe everyday nursing communication and reflect on interactions involving patient understanding, uncertainty, professional responsibility, and the nursing role.

Accordingly, this study examined students' interpretations of authentic clinical encounters rather than hypothetical communication scenarios.

## Setting and participants

Participants were undergraduate nursing students undertaking surgical clinical placement at a university-affiliated teaching hospital. A purposive sample of 32 Year 3 students was recruited, comprising 16 international students and 16 local students (Table 1). Eligibility criteria included enrolment in the undergraduate nursing programme and participation in the scheduled surgical clinical placement during the study period. Participation was voluntary, and all participants had no previous formal clinical practice experience.

Table 1
Characteristics of participants.

| **Characteristic** | **Participants (n = 32)** |
|---|---|
| Student cohort | |
| International students | 16 |
| Local students | 16 |
| Gender | |
| Male | 11 |
| Female | 21 |
| Year of study | |
| Year 3 undergraduate nursing students | 32 |
| Clinical placement | |
| Surgical nursing placement | 32 |
| Previous clinical practice experience | |
| None | 32 |

As novice learners entering authentic clinical environments, participants were well positioned to observe communication encounters with relatively few established professional assumptions. This enabled reflection on situations involving uncertainty, competing interpretations, and changing communication dynamics associated with AI-mediated clinical communication. The inclusion of both international and local students was intended to capture a broader range of reflective perspectives rather than to facilitate formal comparison between participant groups.

## Conceptual orientation before clinical placement

Before clinical placement, participants attended a brief conceptual orientation introducing the study's analytical framework of interpretive authority, professional responsibility, and uncertainty communication. The session was designed to establish a shared conceptual framework for interpreting communication encounters during placement rather than to provide communication skills training or instruction in AI technologies.

The orientation explored how AI-generated and digitally mediated health information may influence patient understanding, expectations, and clinical communication. It encouraged participants to consider how communication may become complex when patients enter healthcare encounters with pre-existing interpretations shaped by external information sources. Illustrative clinical examples and guided discussion prompts were used to support subsequent reflective inquiry rather than to prescribe specific communication strategies or professional responses. The orientation materials are provided in **Supplementary Material 1**.

## Reflective inquiry during clinical placement

During clinical placement, participants were invited to observe and document communication encounters in which patient understanding appeared to be influenced by AI-generated or digitally mediated health information. Because the precise origin of patients' information could not usually be verified, the analysis focused on participants' interpretations of communication situations in which digital information appeared to shape patient understanding and subsequent clinical interactions.

Participants completed structured reflective logs documenting encounters they considered communicatively or professionally significant (Table 2). Reflection prompts invited participants to consider how patients' understandings had been formed, how healthcare professionals responded to differing interpretations, how uncertainty was communicated, and how nurses enacted professional responsibility. Participants also reflected on their own responses to these encounters, including experiences of uncertainty, hesitation, discomfort, or difficulty.

Table 2
Reflective prompts used during clinical placement.

| Reflective domain | Example prompt |
|---|---|
| Patient understanding | How did the patient appear to understand their condition or treatment before consultation? |
| Sources of patient understanding | Did the patient refer to online, AI-generated, or other externally sourced health information? |
| Communication encounters | Did you observe disagreement, uncertainty, or communication difficulties during the interaction? |
| Professional response | How did healthcare professionals respond to conflicting interpretations or patient expectations? |
| Uncertainty communication | How was uncertainty, variability, or risk explained during the interaction? |
| Personal reflection | Did this situation create feelings of uncertainty, discomfort, hesitation, or communication difficulty for you? |
| Nursing role | What did this interaction suggest about the communicative role of nurses in AI-mediated clinical communication? |

Reflective inquiry focused on observing and interpreting authentic clinical encounters rather than managing patient care or evaluating communication performance. The reflective inquiry guide used during clinical placement is provided in **Supplementary Material 2**.

## Facilitated post-placement reflective discussions

Following clinical placement, participants took part in facilitated group discussions to elaborate on the communication encounters documented during placement (Table 3). Guided by semi-structured prompts based on interpretive authority, professional responsibility, and uncertainty communication, participants reflected on situations they perceived as communicatively difficult, uncertain, emotionally challenging, or professionally significant.

Table 3
Overview of the study procedures and reflective inquiry during clinical placement.

| Study phase | Research procedure | Purpose |
|---|---|---|
| Conceptual orientation before clinical placement | Participants attended a brief conceptual orientation introducing the analytical concepts of interpretive authority, professional responsibility, and uncertainty communication. Illustrative clinical scenarios and guided discussion prompts established a shared conceptual framework for subsequent reflection during clinical placement. | To establish a shared conceptual framework for recognising and interpreting AI-mediated clinical communication encountered during clinical placement. |
| Reflective inquiry during clinical placement | Participants completed structured reflective logs documenting communication encounters involving AI-informed patient understanding, conflicting interpretations, uncertainty communication, and AI-mediated health information encountered in routine nursing practice. | To document participants' interpretations of AI-mediated clinical communication and its influence on nursing communication and professional practice. |
| Facilitated post-placement reflective discussions | Participants engaged in facilitated reflective discussions exploring AI-mediated communication encounters, professional responsibility, interpretive authority, uncertainty communication, and the evolving communicative role of nurses observed during clinical placement. | To generate rich qualitative accounts of how participants understood the influence of AI-mediated clinical communication on nursing practice and professional formation. |

The purpose of these discussions was to generate rich qualitative accounts of how participants interpreted communication encounters during clinical placement rather than to assess communication competence or educational outcomes. All discussions were audio-recorded and transcribed verbatim for analysis.

# Data collection

Data were generated from two sources: (1) structured reflective logs completed during clinical placement and (2) transcripts of facilitated post-placement reflective discussions.

Reflective logs documented communication encounters that participants considered communicatively or professionally significant, together with their reflections on patient understanding, communication tension, uncertainty, professional responsibility, and the nursing role. Participants were encouraged to focus on situations they found meaningful for understanding nursing communication rather than to provide comprehensive descriptions of clinical activities. Accordingly, data collection centred on participants' interpretations of AI-mediated communication encounters rather than on communication performance, clinical decision-making, or patients' use of specific AI technologies.

# Data analysis

Data were analysed using reflexive thematic analysis following Braun and Clarke[24, 25]. Analysis involved iterative familiarisation with the data, inductive coding, theme development, and refinement across reflective logs and discussion transcripts.

Although informed by the conceptual dimensions of interpretive authority, professional responsibility, and uncertainty communication, themes were developed inductively from the data rather than imposed a priori. Coding focused on participants' accounts of patient understanding, communication tensions, uncertainty, professional responsibility, and the evolving nursing role. Through iterative discussion within the research team, codes were reviewed, compared, and organised into broader themes.

Consistent with reflexive thematic analysis, themes were understood as interpretive constructions developed through active researcher engagement with the data. Throughout the analytical process, reflexive attention was given to how the researchers' theoretical positioning and disciplinary perspectives shaped coding, theme development, and interpretation. Themes were refined through repeated engagement with the dataset to ensure conceptual coherence and close alignment with participants' reflective accounts.

## Rigour and reflexivity

Rigour was enhanced through the use of two complementary qualitative data sources: structured reflective logs and facilitated group discussions. Together, these data sources enabled comparison across different forms of participant reflection and strengthened interpretive depth.

Theme development was undertaken collaboratively through iterative discussion, critical review, and comparison of emerging interpretations. Rather than seeking coder agreement, these discussions were used to challenge assumptions, refine conceptual interpretations, and strengthen analytical coherence.

Consistent with a reflexive qualitative approach, the researchers acknowledged that interpretation was shaped by their theoretical positioning and ongoing engagement with the analytical process. Given the exploratory nature of the study, the analysis sought to generate conceptual understanding rather than objective measurement or statistical generalisation. The study also did not seek to verify the factual accuracy of patients' AI-related information; instead, the analysis focused on participants' interpretations of communication encounters in which digitally mediated information appeared to influence patient understanding, professional responsibility, or communication about uncertainty.

## Results

# Participant engagement

A total of 32 undergraduate nursing students participated in the study, including 16 international students and 16 local students (Table 1). All participants completed structured reflective logs during

clinical placement and participated in facilitated post-placement reflective discussions.

Participants described a broad range of authentic clinical communication encounters in which patient understanding appeared to be influenced by AI-generated or digitally mediated health information. Their reflections highlighted pre-formed patient interpretations, conflicting understandings of clinical information, uncertainty surrounding treatment and recovery, and challenges in communicating risk and prognosis. Across the dataset, participants consistently interpreted these encounters as professionally and communicatively significant, emphasising the interpretive, relational, and practice-based dimensions of nursing communication rather than the technical aspects of AI.

# Overview of thematic findings

Reflexive thematic analysis identified four interrelated themes describing how participants experienced and interpreted AI-mediated clinical communication during authentic clinical placement (Table 4):

Table 4
Themes of AI-mediated clinical communication.

| Theme | Subtheme | Implications for nursing communication |
|---|---|---|
| Encountering AI-informed patient understanding | Patients entering care with AI-informed understandings | Patient understanding increasingly develops before professional consultation |
| | Confidence in AI-generated or digitally mediated information | Patients' prior understandings influence expectations and subsequent communication |
| Negotiating patient understanding in clinical communication | Comparing professional and AI-informed explanations | Communication increasingly involves negotiating differing interpretations |
| | Maintaining trust while addressing conflicting understandings | Professional credibility is strengthened through interpretive and relational communication |
| Communicating uncertainty in nursing practice | Expectations of certainty | Nurses support patient understanding despite expectations of definitive answers |
| | Explaining uncertainty and individual variability | Communication helps patients understand uncertainty while maintaining trust |
| Reframing the communicative role of nurses | Nurses as interpretive practitioners | Nurses facilitate patients' understanding by contextualising multiple sources of information |
| | Relational communication and therapeutic support | Nursing communication increasingly combines interpretation, relationship-building, and professional judgement |

1. Encountering AI-informed patient understanding;
2. Negotiating patient understanding in clinical communication;
3. Communicating uncertainty in nursing practice; and
4. Reframing the communicative role of nurses.

Together, these themes demonstrate that AI-mediated clinical communication extends beyond information exchange and increasingly shapes everyday nursing communication, patient understanding, professional responsibility, and the evolving role of nurses within AI-influenced healthcare environments.

# Encountering AI-informed patient understanding

Participants frequently described situations in which patients entered clinical encounters with pre-existing interpretations of their condition, treatment, or prognosis that had been shaped by online sources, digital platforms, or AI-generated information before consultation. These prior understandings often influenced patients' expectations and created communication challenges when professional explanations differed from their existing beliefs (Table 5).

Table 5
Illustrative quotations and interpretation of the themes.

| Theme | Subtheme | Illustrative quotation | Interpretation |
|---|---|---|---|
| Encountering AI-informed patient understanding | Patients entering care with AI-informed understandings | ... (P07) | Nurses increasingly encounter patients whose understanding is shaped before consultation, requiring communication that builds on patients' existing interpretations. |
| | Confidence in AI-generated or digitally mediated information | ... (P14) | AI-generated information influences patients' confidence and shapes communication before professional consultation. |
| Negotiating patient understanding in clinical communication | Comparing professional and AI-informed explanations | ... (P03) | Professional explanations increasingly require negotiation with patients' existing interpretations. |
| | Maintaining trust while addressing conflicting understandings | ... (P18) | Therapeutic relationships depend on acknowledging patients' concerns while contextualising professional explanations. |
| Communicating uncertainty in nursing practice | Expectations of certainty | ... (P09) | Communicating uncertainty requires professional judgement, reassurance, and support when definitive answers are unavailable. |
| Reframing the communicative role of nurses | Relational communication and therapeutic support | ... (P30) | Nursing communication increasingly combines interpretation, relationship-building, and professional judgement to support patient understanding. |

*"Some patients already believed they understood their condition before speaking with the nurse because they had searched online or used AI tools."* (P07)

*"Patients sometimes trusted the information they found more than the explanation given during the consultation."* (P14)

These encounters challenged participants' assumptions about how patient understanding develops in clinical practice. Rather than viewing communication as the simple delivery of clinical information, participants increasingly understood it as an interpretive process in which nurses engage with patients' existing understandings, negotiate differing interpretations, and respond to information formed before clinical consultation.

# Negotiating patient understanding in clinical communication

Participants described situations in which patients' prior interpretations conflicted with explanations provided by healthcare professionals, particularly when patients remained strongly committed to information obtained from online or AI-assisted sources (Table 5).

*"It was difficult when patients compared what the doctor said with information they already received online."* (P03)

*"I realised communication is not just explaining facts. Sometimes it involves helping patients reconsider what they already believe."* (P11)

Participants observed that healthcare professionals often responded by balancing clarification, reassurance, and relationship-building rather than simply correcting misinformation. Maintaining therapeutic relationships appeared to depend on acknowledging patients' concerns while carefully contextualising professional explanations.

These reflections suggest that interpretive authority within contemporary nursing practice was experienced as negotiated rather than automatically granted, requiring nurses to establish professional credibility through interpretation, communication, and relational engagement.

# Communicating uncertainty in nursing practice

Communication about uncertainty emerged as a prominent theme across participants' reflections. Students frequently observed that patients expected clear and definitive answers about treatment, recovery, or risk after encountering highly certain online or AI-generated information (Table 5).

*"Patients sometimes expected very clear answers because the online information sounded very certain."* (P09)

*"It was hard to explain that recovery can be different for each person when patients already expected a specific outcome."* (P18)

Participants consistently described communicating uncertainty as one of the most challenging aspects of nursing practice. They observed nurses balancing explanation, honesty, reassurance, and emotional support while helping patients understand the inherently uncertain nature of clinical care. Several participants also reflected on their own uncertainty when observing these interactions, particularly when considering how probabilistic outcomes could be communicated without undermining patient trust. Some participants also highlighted additional challenges associated with communicating uncertainty across linguistic and cultural contexts.

Overall, participants interpreted uncertainty communication as an important aspect of professional nursing practice, extending beyond information delivery to supporting patient understanding while maintaining therapeutic relationships.

# Reframing the communicative role of nurses

Across the reflective accounts, participants increasingly described nursing communication as extending beyond the transmission of clinical information. Instead, nurses were portrayed as interpretive and relational practitioners who helped patients contextualise information, reconcile competing interpretations, and navigate emotionally challenging communication encounters (Table 5).

*"I realised nurses often need to explain why different information exists and help patients understand what applies to their own situation."* (P22)

*"Communication was not only about giving correct information, but also about maintaining trust and helping patients feel supported."* (P30)

Participants described nurses as mediating between patients' existing understandings and clinical knowledge through clarification, reassurance, empathy, and professional judgement. Rather than simply correcting inaccurate information, they observed nurses supporting patients in interpreting complex information while preserving therapeutic relationships.

Collectively, these reflections demonstrate an evolving understanding of the nursing role as interpretive and relational, with communication centred on helping patients understand complex information, negotiate uncertainty, and sustain therapeutic relationships within increasingly AI-mediated healthcare environments.

# Overall synthesis of findings

Across all four themes, participants consistently interpreted AI-mediated clinical communication as a changing feature of contemporary nursing practice rather than simply an informational challenge. Their reflections portrayed clinical communication as an interpretive and relational practice in which patient understanding, interpretive authority, professional responsibility, and uncertainty were continuously negotiated within AI-influenced information environments.

Taken together, these findings illustrate how authentic clinical encounters provided participants with insight into the evolving communicative role of nurses and the changing nature of nursing practice in AI-mediated healthcare.

## Discussion

# Interpretation of key findings

This study explored how nursing students experienced and interpreted AI-mediated clinical communication during authentic clinical placement. Rather than evaluating communication performance or an educational intervention, it examined how students interpreted the changing nature of clinical communication associated with AI-mediated information within routine nursing practice. Guided by the conceptual dimensions of interpretive authority, professional responsibility, and uncertainty

communication, the findings provide empirical insight into how students understood the evolving communicative role of nurses in contemporary healthcare environments[8, 15].

The findings suggest that students increasingly understood clinical communication as extending beyond the transmission of professional knowledge[9]. Instead, communication was experienced as an interpretive and relational practice in which patients frequently entered clinical encounters with pre-formed understandings shaped by online resources, digital platforms, and AI-generated information[9, 27, 28]. Consequently, communication involved negotiating differing interpretations, contextualising externally generated information, and supporting patients in making sense of complex and sometimes conflicting understandings rather than simply providing accurate information[10, 29].

Importantly, participants did not describe themselves as becoming confident or highly competent in responding to these situations[30]. Rather, their reflections revealed increasing awareness of the communicative and professional complexity introduced by AI-mediated information environments[31]. Many described uncertainty, hesitation, and discomfort when observing patients who strongly trusted AI-generated or digitally sourced information, suggesting that early encounters with AI-mediated communication challenged traditional assumptions about professional authority, professional responsibility, and clinical communication. Rather than representing deficiencies in communication competence, these experiences appeared to contribute to a deeper understanding of the interpretive and relational demands of contemporary nursing practice.

Authentic clinical placement appeared to play a central role in this interpretive process. Although the pre-placement conceptual orientation introduced the analytical framework, authentic clinical encounters enabled students to observe how interpretive authority, professional responsibility, and uncertainty communication were enacted in everyday nursing practice. Reflective inquiry encouraged students to interpret these communication encounters rather than simply recognise communication challenges, contributing to a deeper understanding of the interpretive, relational, and practice-based nature of nursing communication[15, 32–35].

Finally, participants consistently described AI-mediated clinical communication as a recurring feature of routine clinical care rather than an isolated technological issue. This finding suggests that AI-mediated communication is becoming an increasingly routine component of contemporary nursing practice, reshaping how patient understanding, professional responsibility, and clinical communication are negotiated in everyday healthcare[8, 15].

# AI-mediated communication and the changing nature of interpretive authority

The findings provide empirical evidence that interpretive authority is becoming increasingly distributed within contemporary clinical communication. Participants consistently described patients entering clinical encounters with pre-formed understandings shaped by online resources, digital platforms, and AI-generated information. These observations are consistent with growing evidence that AI-mediated

information environments are reshaping how patients access, interpret, and engage with health information before professional consultation[5, 11, 15].

Importantly, participants did not simply encounter patients who were “misinformed”; rather, they encountered patients whose understandings had already been constructed through digitally mediated interpretation. Consequently, communication involved negotiating pre-existing interpretations rather than simply providing professional explanations. These findings suggest that AI-mediated information environments are changing not only the availability of health information but also the conditions under which interpretive authority is established within clinical encounters[36, 37].

Participants further described professional authority as negotiated rather than automatically accepted. AI-mediated information did not replace professional expertise but introduced additional interpretive influences that required healthcare professionals to negotiate meaning with patients. This finding supports emerging perspectives that clinical understanding is increasingly co-constructed through interactions among patients, healthcare professionals, and digitally mediated information environments[2, 5, 10].

Within this changing communicative landscape, participants increasingly understood the nursing role as one of interpretive mediation rather than information transmission. Nurses were perceived as helping patients contextualise, interpret, and reconcile multiple sources of information while maintaining trust and therapeutic relationships. This interpretation is consistent with contemporary perspectives that conceptualise nursing communication as a relational and interpretive practice rather than a unidirectional transfer of information[18, 38].

From a nursing practice perspective, these findings suggest that interpretive authority can no longer be understood as residing solely with healthcare professionals. Instead, it increasingly emerges through interactions among professional expertise, patient experience, and digitally mediated information. Preparing future nurses therefore requires more than communication skills alone; it also requires developing the capacity to interpret, negotiate, and respond appropriately when multiple sources of knowledge shape patient understanding and clinical communication[15, 39].

# Professional responsibility in AI-mediated clinical communication

The findings also highlight the evolving nature of professional responsibility in AI-mediated clinical communication. Although patients increasingly arrived with understandings shaped by online resources and AI-generated information, participants consistently described nurses and other healthcare professionals as remaining responsible for supporting patient understanding, maintaining effective communication, and facilitating informed decision-making[40].

These findings illustrate an important characteristic of AI-mediated clinical communication. Although AI systems increasingly influence how patients interpret health information, responsibility for explaining,

contextualising, and responding to misunderstanding continues to rest with healthcare professionals[5, 11]. Participants recognised that clinicians cannot control the information patients encounter before consultation but remain professionally responsible for helping patients interpret that information within the context of individual care[41].

Rather than portraying these situations as technical problems, participants described uncertainty about how healthcare professionals should respond when patients strongly trusted AI-generated information or when externally acquired interpretations conflicted with professional recommendations. These reflections suggest that professional responsibility increasingly depends on interpretive judgement, relational sensitivity, and negotiation of meaning rather than simply correcting inaccurate information[42, 43].

From a nursing practice perspective, professional responsibility should therefore be understood as an interpretive and relational aspect of clinical communication rather than solely as an obligation to provide accurate information. AI-mediated communication does not diminish nurses' professional responsibilities; instead, it reshapes the context in which those responsibilities are exercised. As patients increasingly arrive with pre-formed understandings derived from multiple information sources, nurses are required to support interpretation, sustain trust, and exercise professional judgement within increasingly complex communication environments[44].

# Uncertainty communication as an emerging professional challenge

The findings identify uncertainty communication as a central challenge in AI-mediated clinical communication[10]. Participants frequently reflected on the tension between the apparent certainty of AI-generated explanations and the inherently uncertain nature of clinical practice, particularly in surgical contexts where recovery, prognosis, and treatment outcomes remain variable and evolving[5].

These observations are consistent with scholarship recognising uncertainty as an inherent feature of healthcare communication rather than a problem to be eliminated[10]. Participants increasingly understood that communicating uncertainty required more than providing additional information; it involved helping patients interpret probabilistic outcomes, appreciate individual variability, and navigate situations in which certainty was neither possible nor professionally appropriate[45].

Participants also perceived AI-generated information as presenting clinical knowledge in simplified or overly certain ways, creating additional challenges when nurses sought to explain uncertainty or incomplete knowledge. Rather than viewing uncertainty as evidence of inadequate professional knowledge, participants increasingly understood uncertainty communication as an integral component of professional nursing communication[45].

Although this study was not designed to compare participant groups, several participants described communicating uncertainty as particularly challenging in English-language clinical encounters. These

reflections suggest that linguistic, educational, and cultural factors may influence how uncertainty is experienced and interpreted during clinical placement and warrant further investigation[46].

From a nursing practice perspective, uncertainty communication should be understood not merely as a communication skill but as a core component of professional nursing practice. Nurses are required to communicate honestly about incomplete knowledge while sustaining trust, supporting patient understanding, and maintaining therapeutic relationships. In increasingly AI-mediated healthcare environments, this responsibility includes helping patients understand, tolerate, and make informed decisions in the presence of uncertainty[44].

# Authentic clinical reflection and professional formation

A distinctive contribution of this study is its examination of AI-mediated clinical communication through authentic clinical practice rather than simulated or classroom-based educational settings. Whereas previous research has largely examined AI as a technological or educational innovation, this study explored how nursing students interpreted changing communication practices through reflective inquiry grounded in everyday clinical encounters[22, 44].

The findings suggest that early professional formation is characterised less by mastery of communication techniques than by developing the capacity to interpret complex communication situations. Participants frequently described uncertainty, hesitation, and ambiguity when reflecting on encounters involving AI-generated information, differing interpretations, and communication about uncertainty. Rather than indicating deficiencies in communication competence, these experiences appeared to contribute to a deeper understanding of contemporary nursing communication and professional practice[47, 48].

Reflective inquiry encouraged students to recognise that clinical communication is increasingly interpretive, relational, and negotiated. Rather than focusing on standardised communication strategies, students were prompted to consider how patient understanding was formed, how professional responsibility was enacted, and how uncertainty was communicated within authentic clinical practice[49, 50].

These findings are consistent with reflective and practice-based perspectives of professional formation, which emphasise that professional understanding develops through engagement with authentic clinical situations. Structured reflective inquiry provided opportunities for students to identify, interpret, and critically examine communication dynamics that might otherwise remain implicit during routine clinical placement[49].

Taken together, these findings suggest that reflective inquiry offers an important approach to supporting professional formation in increasingly AI-mediated healthcare environments. As AI continues to reshape patient understanding, communication, and professional responsibility, structured reflection on authentic clinical encounters may help future nurses develop the interpretive judgement, relational sensitivity, and professional understanding required for contemporary nursing practice[15].

# Strengths and limitations

This study has several strengths. First, it examined AI-mediated clinical communication within authentic clinical placement rather than classroom-based or simulated educational settings. By combining structured reflective inquiry with facilitated post-placement discussions, the study generated rich qualitative accounts of how nursing students interpreted changing communication practices associated with AI-mediated clinical communication during early professional formation. Focusing on authentic clinical encounters enabled the study to capture participants' reflections on uncertainty, differing interpretations, professional responsibility, and relational communication as these issues emerged in routine nursing practice.

Second, the study was theoretically informed by the conceptual dimensions of interpretive authority, professional responsibility, and uncertainty communication, providing conceptual coherence across the study design, data collection, analysis, and interpretation. Rather than approaching AI primarily as a technological or educational innovation, the study examined how AI-mediated information environments reshape clinical communication and contemporary nursing practice.

Finally, including both international and local nursing students broadened the range of reflective perspectives represented in the dataset, although the study was not designed to compare these participant groups.

Several limitations should also be acknowledged. The study involved a relatively small sample from a single institution, which may limit the transferability of the findings. In addition, the data were derived from participants' reflective accounts rather than direct observation of clinical communication and therefore represent students' interpretations rather than objective evaluations of clinical practice.

The study also focused on participants' perceptions of AI-mediated communication rather than objective verification of the technologies used by patients. Participants were not always able to distinguish AI-generated information from other forms of online health information, and the findings should therefore be interpreted as reflecting experiences of increasingly AI-influenced communication environments rather than specific digital technologies. Likewise, although several participants described additional challenges associated with communicating uncertainty in English-language clinical settings, the study was not designed to compare participant groups, and these observations should not be interpreted as evidence of differences in communication competence or educational needs.

Finally, data were collected during the early stages of clinical placement, when participants' interpretations were likely influenced by limited clinical experience and developing professional confidence. Future longitudinal research across different stages of nursing education and early professional practice is needed to examine how AI-mediated clinical communication influences professional formation, interpretive judgement, communication practice, and relational nursing care over time.

# Conclusion

This study explored how nursing students experienced and interpreted AI-mediated clinical communication during authentic clinical placement. Guided by the conceptual dimensions of interpretive authority, professional responsibility, and uncertainty communication, the findings provide empirical insight into how AI-mediated information environments are reshaping patient understanding, clinical communication, and the communicative role of nurses in contemporary healthcare.

Rather than demonstrating mastery of communication techniques, participants' reflections revealed clinical communication to be an interpretive, relational, and increasingly complex aspect of nursing practice. Students frequently described uncertainty, hesitation, and ambiguity when encountering patients whose understandings had been shaped by online resources, digitally mediated information, or AI-generated explanations. These findings suggest that early professional formation involves developing the capacity to interpret and respond to complex communication encounters within increasingly AI-mediated clinical environments.

The study also highlights the value of reflective inquiry grounded in authentic clinical practice. Observing everyday clinical encounters enabled students to recognise how interpretive authority, professional responsibility, and uncertainty communication are enacted within routine nursing care, providing opportunities to develop professional understanding that are difficult to reproduce fully through classroom-based or simulation-based learning alone.

More broadly, these findings suggest that AI should be understood not only as a technological innovation but also as a force reshaping contemporary clinical communication and nursing practice. As AI-generated health information becomes increasingly embedded in patients' everyday experiences, nurses will play an increasingly important role as interpretive practitioners who help patients make sense of multiple sources of information, communicate uncertainty, and sustain therapeutic relationships. Supporting the development of these interpretive, relational, and professional communication capabilities should therefore remain an important priority for nursing practice and nursing education in the era of AI-mediated healthcare.

# Abbreviations

**LLMs**
Large language models
**AI**
Artificial intelligence

# Declarations

**Ethics approval and consent to participate**

This study was approved by the Ethics Review Committee of Guizhou Provincial People's Hospital (Ethics Number: 2026-137). Written informed consent was obtained from all participants before data collection. All procedures involving human participants were conducted in accordance with the Declaration of Helsinki and relevant institutional guidelines.

**Consent for publication**

Not applicable.

**Availability of data and materials**

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

**Competing interests**

The authors declare that they have no competing interests.

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**Authors' contributions**

XY, CX and DW conceptualized and designed the study. XY, CX and DW led the methodological development and formal analysis. XY, YX, DL, YS, XZ, JY, BZ, LY, WG, WT, FW, CX and DW contributed to data curation and analysis of relevant empirical literature and adoption studies. XY, YX, DL, YS and CX drafted the initial manuscript. CX and DW critically reviewed and revised the manuscript for important intellectual content and provided overall supervision. CX and DW were responsible for project administration and funding acquisition. All authors read and approved the final manuscript.

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The authors used the generative AI tool GPT-5 (OpenAI, San Francisco, CA, USA) for language refinement, grammar correction, and consistency editing of the English manuscript. The tool was not used for conceptualization, ethical analysis, interpretation, or reference generation. All scientific content, analysis, and conclusions were developed, verified, and approved by the authors.

**Authors' information**

Not applicable.

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# Figures

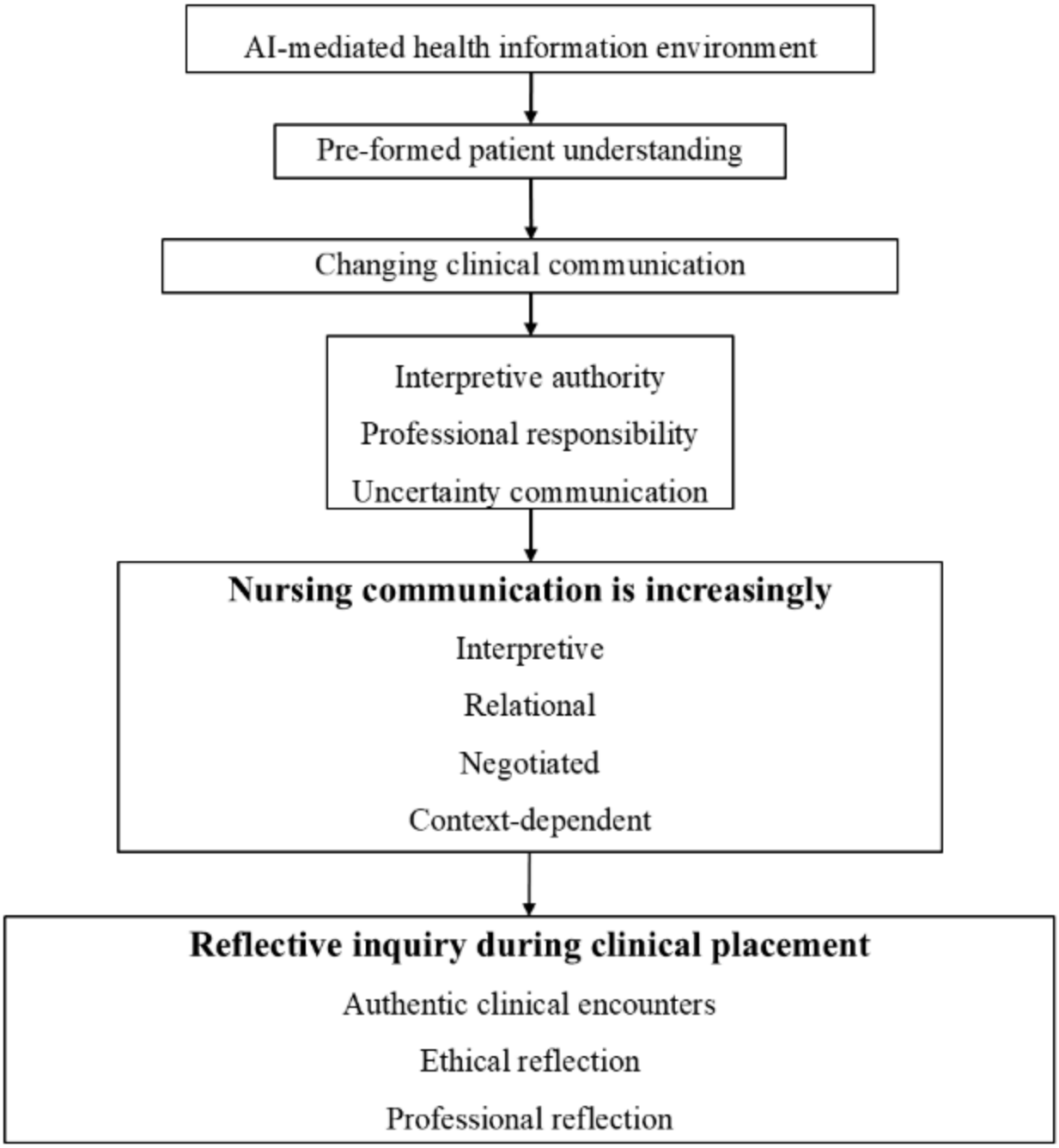



**Figure 1**

Conceptual orientation for reflective inquiry into AI-mediated clinical communication during clinical placement.

This conceptual framework illustrates how AI-mediated information environments may shape pre-formed patient understanding and contribute to changing clinical communication within contemporary healthcare. It identifies interpretive authority, professional responsibility, and uncertainty communication as interconnected dimensions through which nursing communication becomes increasingly interpretive,

relational, negotiated, and context-dependent, providing the conceptual foundation for reflective inquiry during authentic clinical placement.

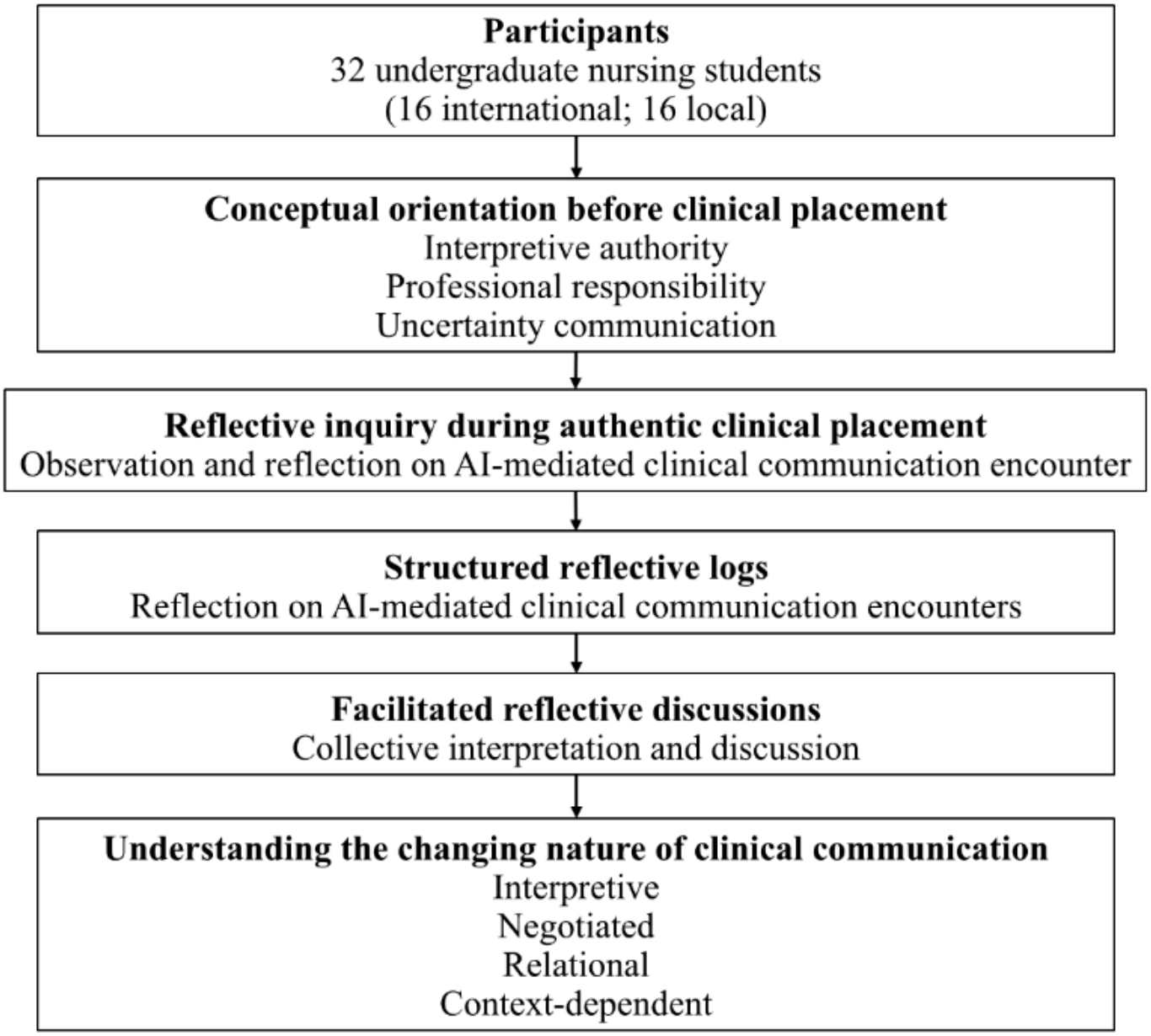



**Figure 2**

Overview of the study procedures and reflective inquiry during clinical placement.

This figure illustrates the sequence of study procedures and reflective inquiry undertaken during clinical placement. Participants first completed a brief conceptual orientation introducing the concepts of interpretive authority, professional responsibility, and uncertainty communication. During authentic clinical placement, they observed AI-mediated clinical communication encounters and completed structured reflective logs. These activities were followed by facilitated reflective discussions to support collective interpretation of participants' observations and experiences. The study procedures were

designed to support reflective inquiry into the increasingly interpretive, relational, negotiated, and context-dependent nature of clinical communication in AI-mediated healthcare environments.

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryMaterial1.Conceptualorientationmaterialsusedbeforeclinicalplacement..pdf
- supplementary2.pdf