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Compassionate primary care training and practice in the digital technology sphere: a scoping review protocol

Formation et pratique des soins primaires empreints de compassion dans le domaine des technologies numériques : protocole d'étude exploratoire

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Introduction

There is growing concern that the increasing adoption of digital health technologies may constrain or detract from the delivery of compassionate, patient-centered care.[1-4] The COVID-19 pandemic accelerated the use of digital health technologies,[1,5,6] with primary care experiencing a significant rise in their use.[7,8] Digital health technologies encompass a range of tools, including telemedicine (e.g., e-referrals, virtual visits), medical devices (e.g., wearables), remote monitoring, and emerging applications of artificial intelligence (e.g., AI scribes).[6] These technologies have been noted to offer various benefits for both patients and providers. For example, virtual visits can enhance access and convenience by reducing time and distance-related barriers,[9] electronic medical records can improve efficiency by automating information entry and enabling rapid information retrieval,[10,11] and AI scribes can help automate visit documentation based on the clinical encounter, allowing providers to focus more fully on patient interaction.[12-14] However, these same technologies have also been reported to introduce challenges. Clinicians have described reduced ability to interpret nonverbal cues,[15-17] and limited opportunities to build rapport when delivering virtual care. Technologies such as AI scribes or electronic medical records have reportedly introduced documentation-related challenges, including errors in automated entries, omission of information,[13,14] and increase administrative activities that take time away from patient care.[18,19] These constraints can disrupt therapeutic relationships, undermine high-quality care delivery, and displace the patient as the central focus of care.[2,3,20-22]

As screen-mediated interactions become more common,[7,23-25] questions have emerged about how these technologies affect the quality of human connection and interactions during clinical encounters. This is particularly important as delivering compassionate care broadly has been linked to a range of positive outcomes for patients. These include better treatment adherence, increased trust in providers, reduced anxiety and enhanced overall quality of life.[26-29] Compassionate care helps foster strong therapeutic relationships built on trust and respect,[16,29,30] creating safe environments for patients to receive the care they need.[29,31] In addition, for clinicians and medical learners, practicing compassionate care has been linked to lower burnout and improved professional morale.[26]

Given the rise in technology-mediated care, primary care providers must be equipped to use these tools while maintaining compassion.[32] This matters as primary care

providers play a central role in building therapeutic relationships, coordinating care, and supporting patients longitudinally.[33] National organizations have emphasized the importance of compassion in medical education and practice[34,35] given its well-documented benefits,[16,30,36,37] however, compassion remains largely overlooked in discussions about digital health technologies.[2] Medical learners report uncertainty in delivering compassionate care amid time and administrative pressures.[38,39] Additionally, medical student perceptions of the use of artificial intelligence in education reported concerns about practicing with AI-enabled technologies, describing the encounters as similar to talking to a screen, and limiting their ability to perceive emotions or develop empathy.[40-42] These concerns highlight the need for training and tailored guidance as medical learners and professionals navigate an increasingly digital clinical environment. Here, clinical educators are key to helping learners develop both the technical and relational competencies needed to provide compassionate care in this environment.[43]

Although some reviews addressed compassionate care in other settings,[29,32] little is known about how this is enacted in primary care, where continuity and longitudinal relationships are central.[33] Moreover, evidence supports the benefits of compassion training,[44,45] however, it is unclear how this is being enacted in training and clinical practice when digital health technologies are involved. This review aims to address these gaps by examining this key area in primary care.

Methods

We are conducting a scoping review on training and clinical practice of compassionate care using digital health technologies through Arksey and O'Malley's framework.[46,47] This review is registered with the Open Science Framework.[48]

Stage 1: Identifying the research question

What is known about how electronic health records, virtual care and artificial intelligence influence the delivery of compassionate care in the training and clinical practice of medical trainees, family physicians, and nurse practitioners in primary care?

We will also explore a set of sub-questions:

- What is known about providing compassionate care using digital health technologies in primary care?
- How are digital health technologies such as electronic health records, virtual care and artificial intelligence being used by primary care providers in the delivery of compassionate care?
- What is known about teaching and learning approaches for delivering compassionate primary care in a digitally-mediated setting?
- What strategies, curricula or teaching approaches exist for facilitating compassionate care delivery among medical trainees, family physicians and nurse practitioners in primary care in a digitally-mediated setting?
- What are the best practices for delivering compassionate primary care in a digitally-mediated setting?

Stage 2: Identifying relevant studies

We developed a search strategy with an information librarian (EW) tailored to these databases: MEDLINE/PubMed, Embase, CINAHL, Cochrane Database of Systematic Reviews, ERIC, Joanna Briggs Institute, and Web of Science (Supplementary File 1). These were chosen to capture insights across healthcare and education. We used the population-concept-context framework,[49] to scope the review and the eligibility criteria.

We will include peer-reviewed studies published between 2015 and 2025 to capture contemporary evidence, reflecting recent developments and practices in digital health technologies and medical education curricula (Table 1).

Stage 3: Study selection

Two reviewers will independently screen titles, abstracts, and full texts using Covidence.[50] A pilot test of 30 articles will ensure 80% agreement. Discrepancies will be resolved with the Principal Investigator. Screening outcomes will be reported using a PRISMA-ScR diagram.

Table 1. Eligibility criteria

Item	Inclusion	Exclusion
Population	Participants in family medicine (e.g., family physicians, family medicine residents, medical trainees) and in nursing (e.g., nurse practitioners, and nursing students training to become nurse practitioners)	Participants in specialties outside of family medicine or family practice nursing, such as internal medicine, surgery or allied health professions (e.g., physiotherapists, social workers) Studies that have patients as the sole focus of the intervention should be excluded
Setting	Studies conducted in primary healthcare settings such as family medicine clinics or academic teaching practices.	Studies conducted in non-primary care settings such as hospitals, emergency departments, long-term care facilities or specialty clinics.
Intervention	Digital Health Technology: Studies that describe use or evaluation of digital health technologies that support direct patient care, or communication such as electronic health or medical records, virtual care platforms, artificial intelligence and others.	Digital Health Technology: Studies that do not involve digital health technology, including non-digital interventions or paper-based medical records. Studies that focus solely on administrative or technical infrastructure, patient-only apps or digital health technologies not used for patient-provider interaction and delivery of care. Examples such as billing software, stand-alone patient-self management apps would be excluded. Studies focused on technical implementation of these technologies, rather than their role in compassionate care or education.
	Educational: Focus on educational interventions or descriptions of best practices designed for training family medicine residents, physicians, nurse practitioners and students in primary care settings. This can include simulation-based training, didactic lectures, workshops, case-based learning, and others.	Educational: Studies that do not focus on educational interventions related to compassionate care in primary care. Studies focusing on general medical training without a focus on compassionate care in a digitally-mediated setting.
Time Frame	Peer-reviewed articles published between 2015 to 2025.	Peer-reviewed articles that are published before 2015.
Study Design	Peer-reviewed articles that employ all types of study designs including experimental, quantitative, qualitative, mixed-methods, or observational.	Articles that are not peer-reviewed. We will exclude opinion pieces, commentaries, editorials, conference abstracts, any type of literature reviews (e.g., narrative, scoping, systematic), theses or dissertations, or grey literature (e.g., reports, briefings).
Language	Written in the English language.	Articles not written in the English language.

Stage 4: Data items and data collection process

A data extraction sheet was co-developed with the research team to select relevant information from eligible articles (Supplementary File 1). Two members will extract data on study characteristics, the types and functions of digital health technologies used to support compassionate care, and any educational approaches or interventions described. Reported outcomes (e.g., reactions to educational intervention, changes in knowledge or skills, broader impact), strategies, best practices or lessons learned will also be captured.

Stage 5: Synthesizing and reporting the results

We will use descriptive statistics to summarize study characteristics, and types of digital health technologies used. For studies incorporating educational interventions, we will categorize and quantify the different types of teaching and training approaches used. The frequency of each educational intervention will be reported to allow us to understand the common pedagogical strategies used.

We will conduct qualitative content analysis to identify and categorize recurring insights and themes.[51] Findings will be coded, categorized and synthesized to facilitate interpretation and comparison across studies. NVivo will be used to manage the analysis. Findings will be reported according to PRISMA-ScR guidelines.[52]

Stage 6: Consultation

We will consult with five to ten experts across primary care, digital health technologies, and medical education within the home university department to validate findings. These discussions will inform future research directions and dissemination. We will also collaborate with our patient partner (PK), whose lived experience and expertise will ensure a patient-centered interpretation of the results.

Summary

This work will synthesize evidence on how primary care providers teach to and practice compassionate care delivery in the digital health technology sphere. In doing so, we will map current approaches, identify gaps, and inform future research and practices that support compassionate care delivery in digitally-mediated primary care settings.

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