Can Answers to the Health Workforce Crisis Be Found in Equity-Informed Digital Health?

COMMENTARY

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ABSTRACT

In this paper, we describe current pressures on health human resources (HHRs) in the Canadian context and related factors that impact equity-deserving communities/ populations. We explore issues of HHR challenges in rural, remote and urban underserved contexts and explore the associated benefits and challenges of incorporating digital health (DH). We present examples and evidence of integrating hybrid models of care as a means of supporting HHRs via DH in the publicly funded health system.

Introduction

Digital health (DH) adoption in Canada holds immense promise and impact, particularly given the country's vast geographical landscape and the pressing demand for accessible healthcare services to support an aging, diverse population with a complexity of needs. Meanwhile, Canadian health systems are facing significant health human resource (HHR) challenges in primary, emergency and other health service delivery areas. HHR is in crisis with challenges such as recruitment and retention that deepen health equity divides. DH can improve access to and quality of care in a strained health system. DH has promise through supporting providers working in underserved contexts and improving access to health services for equity-deserving populations. However, DH is not a panacea for all problems and can increase healthcare providers' workload, among other challenges (Varner 2023). For some patients and communities, it may be the only option. For others, it is not a viable option due to lack of infrastructure/ broadband, so an approach is needed that includes advocacy for vulnerable populations and providers. While DH technologies may be firmly embedded into practice for many, it is vital that we bring an equity-informed lens to the discussion. The COVID-19 pandemic exposed and deepened structural inequities and problems in the health system. We must act on the call outlined by Rabeneck et al. (2023) in their policy paper: strengthen primary care, use community-embedded care approaches and improve integration and continuity of care. Investment in equity-informed, publicly funded DH may be key to incrementally addressing this call and supporting members of a strained health workforce while improving access to health services for equity-deserving populations.

The Interplay of HHR and DH in the Canadian Context

Canada's DH transformation transcends the mere integration of technology; it is deeply intertwined with the active involvement of healthcare professionals. In a nation witnessing shifts in demographics, the rising aging population and higher acuity and complexity of patient needs – the ability of the health system to adapt and respond swiftly becomes paramount. Top of mind is the health professional–to–patient ratios and how to better manage growing needs. Healthcare will not be able to hire itself out of current demands if we practise and support health in the same ways that got us here. Baker et al. (2016) underscore the urgency of equipping healthcare professionals with digital skills, emphasizing that our healthcare workforce must not only be technologically savvy but also highly adaptable to the ever-evolving digital landscape. This adaptability is a lifeline for serving the diverse and marginalized communities across Canada.

The Role of HHRs in DH Transformation: Advancing Equity for Vulnerable Communities

In British Columbia, the Ministry of Health's 2023/24–2025/26 Service Plan and the digital health strategic framework emphasize the importance of a DH system that reflects the province's cultural and demographic diversity (British Columbia Ministry of Health 2023; Tollinsky 2023). It recognizes the unique needs of First Nations and marginalized communities, striving for DH solutions that are tailored to meet diverse needs. DH solutions are not just tools of convenience; they can be potent instruments for bridging disparities. These solutions transcend clinical gaps and increase service capacity by addressing the unique challenges posed by Canada's vast geography and diverse patient needs in areas such as mental health and substance use, surgical care, access to diagnostic imaging, cancer care, care of older adults, emergency care and longitudinal primary care.

Efficient use of electronic health records (EHRs) translates into improved clinical decision making, medication management and reduced errors – factors that are particularly crucial when serving vulnerable patients who may already face barriers to quality care. In emergency medicine, where timely access to accurate patient information can be a matter of life and death, DH becomes an urgent imperative. Research highlights how the integration of EHRs and telemedicine in emergency departments has the potential to improve care coordination for vulnerable populations, particularly in remote areas (Tsou et al. 2021). The Real Time Virtual Support (RTVS) network in British Columbia (Mah et al. 2024) also speaks to the innovation of DH to support rural and remote community health professionals and patients with increased capacity through health professional recruitment, retention and complementary DH services (Novak Lauscher et al. 2023).

The Canadian Institute for Health Information (CIHI) reports that DH services have significantly reduced travel times for patients in remote and marginalized communities, effectively bringing healthcare services closer to those who need them most (CIHI 2023). In primary care settings, DH has proven invaluable for vulnerable populations who may face challenges in accessing traditional healthcare services (Nott 2023). Empowering patients to take charge of their health is not just an ideal but also a necessity, particularly for those who face systemic barriers to quality care. DH technologies, such as patient portals (e.g., MyChart), enable patients to access their health information, book appointments and communicate with healthcare providers, thereby promoting patient-centred care (Canada Health Infoway 2017).

The urgent call to address healthcare disparities is unambiguous. As we navigate changing demographics and clinical gaps, DH stands as our ally if used to address and redress inequities. The synergy between HHR and DH technologies is not just a matter of innovation, it is also a matter of social justice, a call to ensure that every Canadian – regardless of their circumstances – has access to equitable, patient-centred and efficient healthcare. The urgency of addressing healthcare disparities is never more pronounced than when we consider the potential of artificial intelligence (AI) and predictive analytics in enhancing HHR capacity and decreasing burnout (Peterson and Paiewonsky 2023). AI-powered diagnostic tools have the potential to aid healthcare professionals in the early detection of diseases and other clinical tasks (Yin et al. 2021). Vulnerable populations often bear the brunt of delayed diagnoses and inadequate access to healthcare. If AI is to change this narrative, equitable access to care is needed to ensure the relevance of the data AI would use.

There is a limited supply of graduates and limited interest in working in rural communities.

Rural and Remote Contexts

The health system produces inequities in access for rural, remote and Indigenous citizens and the providers who support them. Geography and the lack of a critical mass of providers contribute to this. Systemic racism and discrimination and the impacts on access and culturally safe care, particularly for Indigenous Peoples, are barriers that must not be reified in DH provision. Geographic isolation creates complex challenges with provider availability and access, in addition to transportation to higher levels of care. This can result in delayed care, longer wait times and added costs for patients. Relationships and trust between patients and providers are essential enabling factors for quality care provision; however, many rural and remote communities have a revolving door of providers.

Rural providers often need to travel between rural communities to ensure continuity of care; this significantly reduces both the number of hours available to provide care and the number of patient contacts within the clinic setting. Rural primary care providers are required to have a strong generalist skill set and additional enhanced skills training to be able to provide an extended scope of practice in resource-limited settings in order to serve the more complex needs of patients in their home communities. Often, there is limited to no availability of other specialist healthcare providers with similar skill sets or locum and/or staff who could provide backup coverage and support. These factors contribute to rural providers expressing concerns around working conditions, medico-legal risk, work–life balance, personal health and remuneration.

Rural and remote communities are disadvantaged when attempting to recruit new providers. There is a limited supply of graduates and limited interest in working in rural communities. Rural generalist demand has increased dramatically; however, there has not been an increase in rural "fit for purpose" healthcare provider training, leading to new providers feeling less confident to practise as rural generalists. In addition, many rural community providers often work well above a traditional full-time workload. As these providers retire, many newer-to-practice providers are expressing concern about providing more than a full-time commitment, requiring the recruitment of additional providers than those currently working in the community.

Urban Vulnerable Populations

Populations living in urban settings who are vulnerable to poor health outcomes due to broader social determinants of health often experience structural marginalization from our healthcare system. Examples include those who experience homelessness, problematic substance use, significant mental health disorders and disability. These individuals often live with limited resources and under chronic stress. There are numerous barriers to in-person care due to mobility challenges, transportation costs, stigma, discrimination, inadequate provider cultural competency and a shortage of healthcare providers. Access to care is a critical step to reducing health inequities, and there is an important role for DH for those experiencing barriers to care. Engagement with the community is critical to improve appropriate DH uptake and best understand how it can be leveraged to improve health outcomes. This could be achieved through user-centred design to identify needs and preferences in order to develop culturally relevant and meaningful DH interventions (Brewer et al. 2020).

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How can DH contribute?

DH provides opportunities to significantly expand patient access to healthcare services for underserved communities. For example, it can be very relevant and useful in its use in rural and remote communities where many Indigenous individuals reside. Rural communities and those living in these communities have different needs from those of urban populations (Chen et al. 2019; CIHI 2006; DesMeules et al. 2012; Stackhouse 2019). Different needs and contexts must be considered with all equity-deserving populations; how DH is deployed will vary depending on the population and the context in which they live or seek health services. Members of equity-deserving populations need to be engaged to understand their needs and how they would like DH services delivered. As healthcare providers build relationships with equity-deserving populations, it will assist them to better understand their needs and enable them to provide the best care possible, including DH approaches contributing to the retention of healthcare providers serving these populations – both a relationship with the communities and knowing that you are meeting healthcare needs can have a positive impact for healthcare providers.

DH care delivery requires the foundation of broadband Internet, devices that support virtual visits and physical environments where patients can have confidential conversations should they wish. Ideally, there would be a secure, cloud-based interoperable EHR that could be accessed for longitudinal care. Currently, many individuals are receiving episodic or emergent care with little follow-up due to the HHR shortage and the barriers outlined earlier. DH may be an important tool to build connection and trust through text messaging and reminders, responding to queries and providing just-in-time information and resources. Team-based care may also be facilitated through DH via both synchronous and asynchronous care. DH has the potential to enhance care for established patients, as well as those who have historically been marginalized. It is up to us to work with these populations and co-create technological solutions that will be adopted and sustained.

DH has the opportunity to address gaps in health services delivery and improve access to comprehensive, culturally appropriate care needed by patients and communities.

DH enables the provision of healthcare support for the most vulnerable and isolated patients, as well as providers, by enabling timely and accessible care closer to home to support better outcomes for patients and providers. *The Edge of Care* (Rothman 2023), a film documenting RTVS in underserved rural British Columbia communities, and co-author and patient partner, Patricia Kay Pearce (Box 1), outline the necessary role of trust and communication. DH, such as RTVS, used in conjunction with the building of community, promotes community development, retention of health workers and continuity of care for patients. Furthermore, DH cannot replace but, rather, can *support* care team members.

Box 1. Vignette: Continuity of care is paramount

The pandemic ushered me into a new community – the community of Long COVID – where virtual care, comparable to in-person care in many ways, became the primary access point as the pandemic made us all remote community dwellers living in relative isolation.

In early 2022, I contracted the SARS-CoV-2 virus with lingering issues that saw me join the provincial "Post COVID-19 Recovery" (a misnomer) clinic, with vast amounts of information available and support conducted virtually on the Zoom platform. About 60- to 90-minute and four- to six-week group sessions on particular symptom clusters were led by occupational therapists, physiotherapists and counsellors. Each client would eventually speak with a physician and, perhaps, be seen in person. Much was done right, yet all of it failed to address one of the biggest problems: a majority of clients suffered from both brain fog and fatigue issues. How would information be retained? In their dedication to anonymity and confidentiality, the clinic overseers failed to see that clients wanted and needed opportunities to support one another through virtual patient get-togethers: learning with others through repetition in the company of true peers to cement community. The provincial clinic model was changed in 2023, involving a staff shuffle. The mental health counsellor was gone, and with him went much of the trust that had been built between patient and care provider. This particular counsellor was exemplary in his communication, sending reminders before sessions and follow-ups after, always including tools and resources. That ended with his departure. As the mental health of almost every patient of the clinic was affected, it was a mystifying choice. Continuity of care is paramount.

What is needed to leverage DH to support HHRs?

Notwithstanding the COVID-19 pandemic that all but required many aspects of care to be delivered remotely, implementing DH technologies continues to face a number of challenges. Some key considerations include the following:

- *When and how to use DH in the provision of care*: Practitioners must understand the clinical issues, patient encounters and scenarios, practice types and patient populations to best apply DH and always be guided by the best interest of the patient, including patient preference and autonomy.
- *Location of patient, care provider and licensure*: A key benefit of DH is access to care, including access across jurisdictions. Implementation must consider practitioner licensure requirements, as well as administrative barriers (e.g., access to electronic medical records) to providing care across providers, provinces and territories.
- *Availability of infrastructure, technology and data interoperability:* This is required to support reliable and secure platforms that can integrate with existing electronic records.
- *Adequate compensation:* This is required to provide care via DH that does not incentivize it over in-person care but that allows healthcare providers to choose the best modality for each patient.
- *Acquiring appropriate consent*: Appropriate consent needs to be acquired to use these

technologies, capture data from their use and have clarity on privacy and security requirements, including meeting statutory obligations.
- *Integrating digital and in-person care*: Digital and in-person care needs to be integrated and existing processes need to be modified for follow-up care and documentation to ensure continuity of care, communication among team members and capturing patient history, diagnoses and treatment plans.
- *Educating healthcare practitioners and patients*: Healthcare practitioners and patients need to be educated on how to use these technologies safely and effectively. This includes promoting DH literacy and awareness of the provider–patient relationship.

Unfortunately, there is a fragmented approach across Canada with respect to addressing the issues outlined above. In the main, it has been left to healthcare practitioners and providers to assess the efficacy, risks, considerations and benefits of DH solutions themselves. The potential benefits from DH to address HHRs and serve various populations will continue to be stymied without collaboration across providers and jurisdictions to:

- develop consistent clinical and professional standards and licensure requirements;
- invest in appropriate infrastructure, including access to data bandwidth;
- propagate clear and consistent guidance and tools to address privacy and security concerns;
- provide options for both digital and in-person care; and
- ensure appropriate professional and technical training and support.

Maintaining an Improvement Lens

Measuring the right outcomes with continuous evaluation of DH delivery will contribute to ongoing improvement as approaches evolve and population needs change. The Quintuple Aim (Nundy et al. 2022) includes five dimensions to be evaluated: patient experience, provider experience, population health, healthcare costs and equity. Provider experience (lack of provider engagement, burnout and workplace safety) was found to be directly related to poorer health outcomes for patients along with higher costs and are essential as key outcomes to be measured (Sikka et al. 2015). Context is also important in determining what works and for whom (Coles et al. 2017; Kaplan et al. 2012) and must be considered in evaluating outcomes. Outcomes related to DH should be identified for each of the dimensions through the engagement of various perspective groups, including patients, providers, decision makers and policy makers. Ensuring that data are available or creating means of collecting data (e.g., surveys with patients and providers) will provide essential information to adapt and improve DH to facilitate better outcomes for patients, providers and the health system.

Conclusion

DH is not a "fix all" solution, but if used wisely in conjunction with in-person services to strengthen access, continuity for patients and communities and connection and support for providers, it can be a force for positive change. As Rabeneck et al. (2023) point out, "the pandemic has shown us that the ways in which we care for our more vulnerable people; the very old, very young, and those living with factors that lead to marginalization need to change" (p. 2). DH must be deployed to address inequities and crises, not to entrench and reify them.

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