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Examining virtual visit use during a pandemic and perspectives of primary care providers, patients and caregivers: a mixed-methods research protocol

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ABSTRACT

Introduction COVID-19 prompted rapid shifts to virtual primary care; however, the secondary implications and ideal applications of this change require further consideration. Patient and public stakeholder input has been bypassed. To integrate virtual care (VC) in what currently appears to be a lengthier battle against COVID-19 and related sequelae, further investigation is needed to support ideal implementation and use. This study aims to describe factors associated with the use of virtual visits in primary care practices, along with more in-depth description of users' experiences and perspectives.

Methods and analysis This study will be conducted in three phases, using a mixed-methods approach and in consultation with community advisors. Phase 1 will analyse data from electronic medical records (EMRs) to characterise the use and users of VC in primary care during the early phase of the COVID-19 pandemic. Analysis will be primarily descriptive; regression modelling will assess associations between patient and provider factors with a virtual visit. In phase 2, we will use an EMR-facilitated process to automate the distribution of patient surveys within an estimated 10 clinics. These surveys aim to describe care experiences, transactional use and perspectives of VC. In phase 3, focus groups with patients, caregivers and primary care clinicians will seek more in-depth exploration of VC regarding accessibility of care, acceptability and perceptions of quality care. Interpretive phenomenological analysis will be used for thematic analysis. The framework method will employ a matrix structure to organise the data and to facilitate comparison, integration and further interpretation.

Ethics and dissemination This study has been approved by the University of Manitoba's Health Research Ethics Board (HS24197). A co-designed dissemination strategy will include reports and infographics to policymakers and the public, manuscripts and presentations to academic and clinician audiences, and contributions to a learning plan for professional development.

INTRODUCTION

The onset of COVID-19 and subsequent waves have activated public health measures to manage and prevent viral transmission.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study will use multiple data sources through implementation of a patient-oriented design guided by the input of members of a community advisory committee.
⇒ The use of mixed methods is an optimal approach for combining clinical health information and qualitative data from physicians and patients to provide contextual understanding and multilevel perspectives of virtual care during the early and mid-stages of the COVID-19 pandemic.
⇒ The novel use of electronic platforms to automate the distribution of patient surveys provides an opportunity to minimise the burden of research participation on clinical practices.
⇒ Electronic surveys may limit the findings, by missing input from those who do not have adequate access to the internet or technology, or have difficulty navigating an online survey programme.
⇒ The insights collected about the utility of virtual care will lead to a greater understanding of optimal use, its impact on equity, and what is needed to continue to develop and sustain virtual care in primary care.

Primary care clinicians play an essential front-line role in addressing COVID-19-related health concerns while still managing all other general health needs. Many primary healthcare clinics include providers such as primary care physicians, nurse practitioners and paediatricians who have rapidly implemented virtual care (VC) (the term 'virtual care' includes a breadth of technology-based care, but in this research, it refers to the use of VC technology for facilitating synchronous provider–patient/caregiver interactions) and interact remotely via telephone or video in order to provide quality care for patients while physically distancing.[1–4] While this substantial shift in clinical healthcare delivery was necessary, there was initially little

opportunity to plan or address how VC was implemented, ideal applications, guiding policies or factors influencing sustainability.[5]

The use of various forms of technology in healthcare, including for virtual interactions and service delivery, has advanced over the last few decades.[6–8] Yet until very recently, Canada had low utilisation of technology for patients to communicate and the notable absence of a national framework to guide implementation.[1 9–12] Payment models and infrastructure options to support and promote VC were underdeveloped, with few Canadian provinces offering reimbursement for VC services prior to the pandemic.[4 12–14] Within primary care, there was limited integration of VC in clinical practice and it was considered a complement to existing modes of care.[3 13] However, in the current pandemic environment, VC is one of the primary options for facilitating access to health services, and primary care providers play an important role in its delivery.[13 15] Not only does primary care provide essential, front-line services to help address COVID-19-related health concerns, it also provides an array of care and support to patients throughout the pandemic.[16 17] Thus, primary care practices in particular have seen rapid implementation of VC (telephone, video) in order to maintain continuity of care and address the general health needs of patients.[18]

A 2019 review conducted by the Canadian Institute for Health Information regarding delivery of electronic consultations in primary care acknowledged improvements in care delivery although further investigation of the 'rules of online engagement' and user experiences is needed.[11] With the urgent and rapid introduction of healthcare initiatives in response to COVID-19, patient and public stakeholder input has been bypassed even though the crisis is highlighting gaps in healthcare that patients and caregivers know and experience.[8 18–21] In particular, the intersections of patients' health and social issues create complexities where VC may be less than ideal, potentially amplifying communication challenges and navigational difficulties within an often siloed healthcare system. Hearing directly from the patients and public will create more responsive and tailored use of technology to meet patients' and caregivers' needs, and to sustain continuity of care and optimal communication. For VC specifically, providers' perspectives about the impact of VC on provider workload, quality of care and clinic workflow, as well as patient experiences with respect to accessing VC, are lacking.[4 22 23]

Using a patient-oriented focus, this study will describe the factors associated with the use of VC in primary care practices during the early to mid-pandemic periods in Manitoba, Canada, encompassing the first 20 months within which VC was supported by a tariff within a single-payer healthcare system. Drawing from the perspectives and experiences of key 'user' groups (ie, primary care providers, patients and caregivers), this study will explore the usability, acceptability and sustainability of VC and how virtual health service delivery can be improved going forward. Together, the findings will be based on retrospective use and experience with VC to inform patient-centred policy development and implementation recommendations for VC delivery.

Conceptual framework

The Non-adoption, Abandonment, Scale-up, Spread and Sustainability (NASSS) Framework[24] will guide this study, as it is evidence based and invokes a more nuanced assessment given the potential complexity of implementing technology into a healthcare system. Specific domains in this framework (technology, value propositions, adopters, organisation and system) will enable a less linear account of the use of VC and promote a richer description of logistics, the 'human actors' who make it happen and functionality. Figure 1 illustrates how each domain has informed the approach to data collection.

Methods

This study uses an exploratory, mixed-methods approach that proposes using multiple data sources with sequential movement from quantitative to qualitative methods among two 'user' groups: primary care providers and patients/caregivers. The study will be conducted in several phases: the first phase is to characterise the use and users of VC in primary care settings during the COVID-19 pandemic using a retrospective cohort design. The second phase is distribution of a survey to patients, followed by a third phase using focus groups with primary care providers, patients and caregivers. Both will seek to explore experiences of VC, with the survey assessing accessibility and the more practical aspects of the visit, whereas the focus groups will seek perspectives regarding suitability and sustainability as well as the interactional elements of the visit. A capstone event will be a co-design workshop, bringing together key stakeholders to consider findings and develop policy and implementation recommendations.

Patient and public involvement

The multistakeholder research team includes community advisors, with one patient partner contributing throughout all aspects of the project, including design, priority setting, data collection and interpretation. These members of the team were recruited from a patient and public partnership network sponsored by the Manitoba Primary and Integrated Healthcare Innovation Network.[25] Through regularly scheduled communiques, individuals were invited to join the team and contribute to the development of this research. The community advisors will be consulted and their input invited to encourage consideration of different perspectives and a more nuanced approach based on the experience of being a recipient of healthcare in the current system. The intent is to enhance the applicability of study results to the public. The advisory will meet regularly and prior to study milestones, thus supporting the launch of the study, development of tools and processes for patient data collection, and
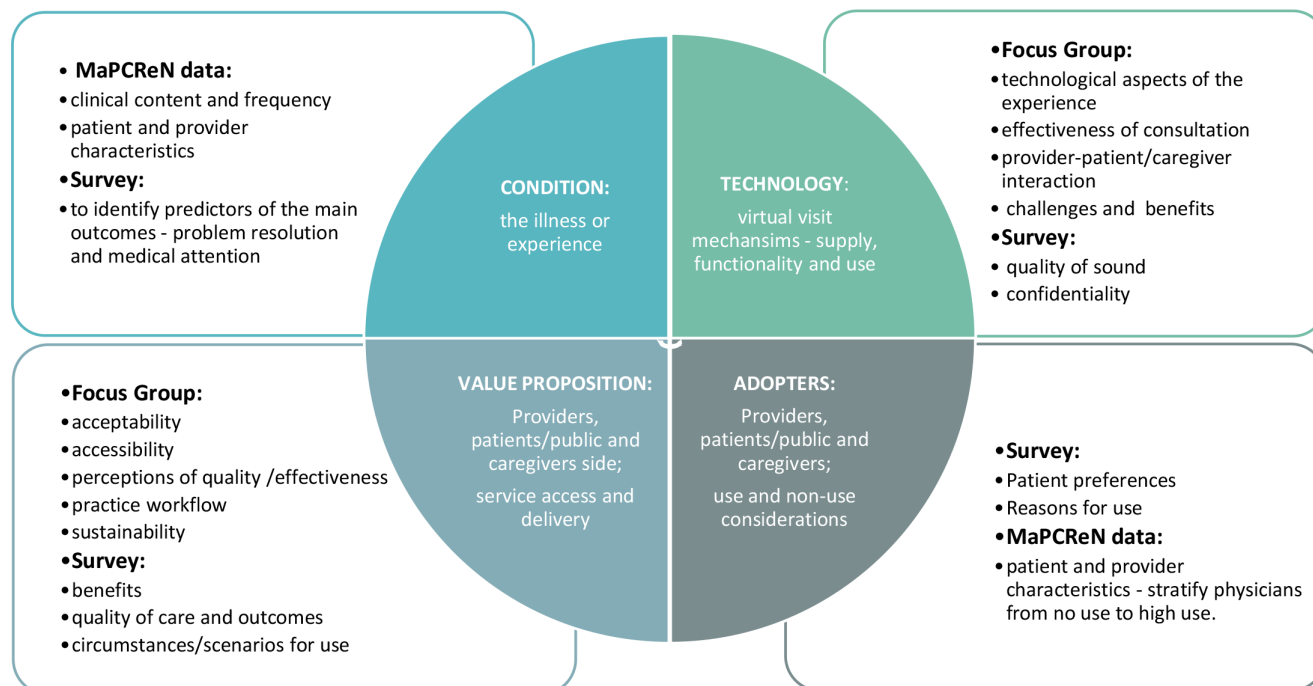
Figure 1 Target domains in the NASSS Framework[24] to guide data collection. MaPCReN, Manitoba Primary Care Research Network; NASSS, non-adoption, abandonment, scale-up, spread and sustainability.

contributing to future recommendations and dissemination activities. Regularly scheduled meetings will include community advisors, the project manager (AB) and principal investigator (GH) as well as with the larger project team at different times. They have elected to be consulted through email and telephone correspondence as well as by regularly scheduled video meetings. Honorariums will be provided to community advisors in recognition of their time and contributions.

Phase 1: retrospective cohort study to characterise the use and users of VC in primary care settings during the early COVID-19 pandemic

Data collection

This study is a retrospective review of early to mid-pandemic virtual visits among providers captured in the Manitoba Primary Care Research Network (MaPCReN), which is a practice-based network within the Canadian Primary Care Sentinel Surveillance Network. It has developed the largest electronic medical record (EMR) database in Canada to extract and process data from consenting primary care providers.[26] MaPCReN contains de-identified EMR from 265 healthcare providers, including family physicians, nurse practitioners and community paediatricians, providing primary care to 288 000 patients in Manitoba, Canada. We will examine the use of VC (phone and video visits) compared with in-person care with primary care providers participating in MaPCReN between 1 January 2018 and December 2021, a time period during which the data are available for analysis. We expect the second quarter of 2020 offers an opportunity to examine VC when it was likely to have been in highest use due to public health restrictions and the newly introduced

tariffs covering virtual visits. Each primary care encounter since March 2020, when patients obtained care virtually, in-person, both virtual and in-person or did not seek regular care, will be assessed.

Analysis and outcomes

Tariff codes from billing records will determine the visit type (in-person, virtual care). Patients will be described by sex, age, comorbidities, visit frequency and prescriptions, as well as providers by sex, age, clinic location, provider type, remuneration, country and year of graduation, and return visit rate according to visit type. Mean (SD), median (IQR) and frequencies (percentages, %) will describe the study population based on visit type, return visit rate, as well patient and provider characteristics. Return visit rate for each patient prior to and following the introduction of the VC tariff code on 14 March 2020 will be compared. The proportion of visits billed as a virtual visit among the practices providing data will be plotted in relation to weekly COVID-19 cases reported in the local region. Finally, a multivariate logistic regression model will assess associations between patient and provider factors associated with at least one VC visit. We will use a generalised estimating equation approach to account for the clustering of patients within providers. Associations using the adjusted OR with 95% CIs will be reported. Statistical analyses will be performed using SAS V.9.4 (SAS Institute). The outcomes reported will identify patient care situations ideal for VC and help inform strategies for sustainable VC in the future.

Phase 2: distribution of a survey (using an EMR-facilitated feedback process) to gain patients' experiences and perspectives of VC

Data collection

Patients of consenting providers from 10 different primary care clinics throughout Manitoba will be asked to complete a brief survey about their experiences of receiving VC. All adult patients (18+ years) who have received at least one virtual visit will be eligible for inclusion. The survey distribution process will be supported by an automated, EMR-facilitated feedback process. Patients who agree to be contacted will receive an email on behalf of the clinic following an appointment with their primary care providers. The email will describe the research and include a secure link to the questionnaire. Additionally, patients may complete the survey remotely and at a time that is convenient for them. The survey will consist of 10–12 questions and take approximately 10 min to complete, and designed to capture care experiences. Specifically, the survey will ask about practical aspects such as how the visit was conducted, reason for the visit, quality of communication, confidentiality concerns and what other options were considered if VC was not an option. The survey will inquire about transactional use of VC, referring to perceived quality and impact on care process, and the outcomes of the visit (whether the visit was complete and if further follow-up was needed). Survey content will include constructs identified within the VC literature[4 27–29] adapted to the local context with input from our community advisory on formatting and language appropriateness. Patient experience survey data will be anonymised and aggregated, so they are never associated with a specific patient or record. All communications established between the clinic EMR and patients will be encrypted and comply with applicable Canadian privacy legislation.

Analysis and outcomes

Response and completion rates will be calculated along with descriptive information on the study sample. Descriptive statistics will be calculated for the patients' rank order and multiple-choice responses and will be stated as frequencies (%) or mean (SD). Multivariate analysis and more robust multilevel analytics will be conducted to identify predictors of the main outcomes: problem resolution and care-seeking choices during the COVID-19 pandemic.

Phase 3: focus groups with primary care providers followed by focus groups with patients and caregivers for in-depth exploration of VC use

Primary care provider focus groups

An in-depth exploration through focus groups with a stratified sample of care providers, based on varying levels of VC use, will provide further insight on how providers differentially addressed patient care during the pandemic. Primary care providers who participate in MaPCReN will be notified of the study through the network's newsletter,

inviting them to participate in focus groups. Focus group topics will address primary care service delivery during the pandemic including shifts in care delivery that followed public health measures, acceptability (including the benefits and challenges) and effectiveness of VC consultations, issues encountered, impact of VC on practice workflow as well as current capacity and future needs to support and coordinate comprehensive patient care through virtual primary care visits.

Patient and caregiver focus groups

A purposive sample of patients and caregivers from primary care practices will be invited to participate in online focus groups. The automated post-visit information and survey from the clinics will invite further participation in focus groups (to complement patient survey data) or as an alternative to completing the survey. We are aiming for maximum variation of experiences from approximately 30 individuals or until theoretical saturation is reached. This input from patients and caregivers will provide greater insight into accessibility of care, acceptability and perceptions of quality VC. Focus group interview guides, co-designed by the community advisory group, will seek to elicit concrete examples from patients of what elements of VC are working, or where changes are required.

Data collection

Focus groups have been pragmatically selected as the data collection method in order to obtain a meaningful sample size within the study time frame. Since virtual visits are limited to non-contact consultation and the breadth of activity that can be performed, a focus group will allow us to compare experiences and explore nuanced differences and perspectives. In consideration of the social distancing measures brought on by the COVID-19 pandemic, focus groups will be conducted using Zoom videoconferencing. Each focus group will consist of a maximum of five participants per group. Prior to attending focus groups, participants will be asked to complete a brief demographic profile comprised of 10 questions. Focus group sessions will take approximately 60 min to complete and all focus group members will be provided with a $50 gift card for their participation. Discussions will be audio-recorded to preserve the authenticity of the feedback and to reduce recall bias when conducting the analysis. Participants will also be given an opportunity to talk with the focus group facilitators outside of the focus group if they choose.

Analysis and outcomes

The provider data set and patient/caregiver data set will be analysed separately. Interpretive phenomenological analysis (IPA)[30] will be used in the initial interpretation of the data to create themes.[30–32] IPA recognises the naturally interpretive role of the researcher in the analytical process and therefore the analysis is a product of phenomenology and interpretation. Methodologically, IPA involves intense detailed analysis of accounts with an

empathic effort to understand the situation as experienced by the participant while critically questioning and speculating around the circumstance or phenomenon. The process of inductively interrogating and analysing the data to link themes and patterns to theoretical knowledge is done through coding, organising, integrating and interpreting the data. In the final phase, IPA includes a more speculative approach informed by direct consultation with existing theoretical constructs and links to the existing literature.

Integration of study components

Resultant data from each phase and user group, namely providers and patients, will be analysed independently, and subsequently converged in order to comprehensively understand VC and its transactional use in primary care practices during the early and mid-pandemic periods in Manitoba. The intent is to represent the mixed-methods data in a visual display to undertake further join analysis. The framework method[33] is the initial means for managing and presenting data as it proposes the use of a matrix with rows and columns representing summarised data. In essence, we will juxtapose the numerical and experiential findings for further analysis. We will undertake an iterative process in developing this matrix or organising structure in order to most suitably integrate the numerical and text data. While the NASSS Framework[24] provides the initial outline, the numerical values (frequencies, ORs), emerging themes, constructs and quotes will contribute to a more detailed matrix. There is an assumption that combining the provider data (MaPCReN and focus groups) and then combining patient/caregiver data (survey and focus groups) would be a suitable first step for data integration as the research objectives are similar for both. Further cross-user comparison is dependent on initial findings and whether there are overlapping constructs. By comparing and contrasting within this integrated data set, we will be able to present the findings to the research team and further interrogate the data through the expertise of multiple researchers and disciplines as well as the community advisory. A capstone event will be a Co-design Workshop, bringing together key stakeholders to consider findings and develop policy and implementation recommendations for VC that are grounded in 'user' experiences. We will continue to use a patient/caregiver engagement strategy that has been useful during the development of this research study. Prior to the meeting, the information is shared with patients and caregiver stakeholders and they are given an opportunity to co-develop key questions and interpretations that can be jointly shared in the capstone event.

ETHICS AND DISSEMINATION

Approval for this project was received from the University of Manitoba's Health Research Ethics Board. Primary care providers who are members of MaPCReN have provided informed consent to participate in the network and collaborative practice-based research. All participants who are invited to join a focus group will be provided with a consent form. Written or verbal consent will be obtained prior to focus group participation for both provider and patient groups. Voluntary consent will be revisited with participants prior to proceeding with each focus group session. For patient surveys, a decision to complete and submit the survey will be considered implied consent. All messaging as part of this study will include an 'opt out', which would remove individuals from unwanted study-related communication going forward. Individuals who participate in a focus group session will received a $50 honorarium.

To disseminate the findings, we will target production of three Knowledge Translation (KT) products. Each KT product will be determined in consultation with the research team once initial findings are available. A minimum of two manuscripts will include briefing reports or notes and infographics to facilitate translation and distribution of findings among policymakers and the general public. Infographics are an important complement to the manuscripts in summarising and facilitating translation to a wider audience, and will be produced in consultation with our research team. The lessons learnt, such as strategies to enhance workflow and patient–provider interactions, will also be translated to a learning plan for continuing professional development. We will also leverage presentation opportunities in the future, with a particular focus for primary care providers. Lastly, results and lessons learnt will be presented at national conferences where VC has begun to emerge as a key topic.

DISCUSSION

The COVID-19 pandemic is having lasting impact on health systems in Canada and throughout the world, provoking rapid and dramatic shifts in healthcare delivery.[34] A promising approach has been the delivery of VC as a mechanism for primary healthcare delivery in response to and as a key adaptive strategy for the COVID-19 pandemic; and yet, few studies have explored the role of VC from the perspectives among different user groups. The proposed research will have many contributions to offer. First, this study will collect diverse data through implementation of a patient-oriented design guided by the expertise of members of a community advisory who have longstanding exposure to the primary healthcare system. Second, employment of mixed methods is an optimal approach for combining clinical health information and qualitative data from physicians and patients to provide contextual understanding and multilevel perspectives of VC from those who have delivered and received VC during the early and mid-stages of the COVID-19 pandemic. Third, the insights collected about the utility of VC will lead to a greater understanding of optimal use of VC, its impact on equity, and what is needed to continue to develop and sustain VC in primary care. Fourth, outcomes from this study will provide

context to inform strategies that will have an impact on VC delivery and sustainability to ensure quality services that meet the healthcare needs of patients. Against the backdrop of a complex health system, this investigation will consider and co-design recommendations and help inform medical guidelines related to the role of VC in the ongoing management of the health of Canadians. The recommendations consider system complexity and will inform local practice and policy at the organisational and governance levels and add to the ongoing global conversation regarding VC.[35]

This investigation will consider complexities in the health system and therefore, attempt to recruit diverse practices in order to capture a breadth of experiences and factors but will be limited in terms of drawing overall conclusions. Additionally, while the novel use of the EMR to automate the distribution of patient surveys will minimise the burden of research tasks on clinical practices, it may also limit the participation of patients without adequate internet access or technology. Equally, electronic surveys may deter participation for those who do not feel comfortable navigating online surveys or prefer paper or other modalities over electronic survey. This is a limitation of this means of survey distribution and VC access and use among equity-deserving populations will require further investigation in future.

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