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# Evaluating patient perceptions of quality of care through telemedicine during the COVID-19 pandemic

Patient satisfaction with primary care providers has been very positive during the pandemic and has largely been similar for telemedicine and in-person consultations.

## ABSTRACT

**Background:** Telemedicine was rapidly implemented at the start of the COVID-19 pandemic, yet there are limited studies that explore patients' perceptions of their quality of care due to this change.

**Methods:** A survey with qualitative and quantitative responses based on the Canadian Primary Care Patient Experience Survey was provided to patients with in-person and telemedicine appointments at a multiphysician primary care clinic in Langley, BC, between 1 November 2020 and 15 February 2021.

**Results:** In total, 777 patients received the survey link; the survey response rate was 54.8%. There was a statistically significant difference between the telemedicine and in-person cohorts for the time between making the appointment and seeing the physician ( $P = 0.03$ ), but there were no statistically significant differences for the other

parameters. Overall, 32.3% of patients had no preference between modalities, whereas 54.9% preferred in-person consultation.

**Conclusion:** Satisfaction with in-person and telemedicine appointments was largely similar. Therefore, physicians can triage and use telemedicine appropriately to manage workflow, reduce wait times, and expand health care to rural/remote regions of the country postpandemic with no significant change in patients' experience of health care interactions.

## Background

Telemedicine can be broadly defined as the use of electronic information and telecommunications technologies to facilitate health care services, with a common form being virtual care.<sup>1,2</sup> Prior to the COVID-19 pandemic, telemedicine was used primarily to bridge the gap for rural or remote locations where there is lack of transport, mobility, or funding.<sup>3,4</sup> While there has been increasing patient demand for telemedicine, many barriers existed with regard to governance of compensation mechanisms, licensure restrictions, and technology infrastructure across health care platforms and facilities.<sup>5</sup> At the start of the COVID-19 pandemic, the use of telemedicine was expanded due to the necessity to limit vectors of disease spread. Primary care has been significantly impacted by this change. In-person visits have been

limited to those deemed necessary, and telemedicine has been widely used as a tool to provide patient care while maintaining social distancing. Throughout this rapid period of change, there has been limited literature on patient perceptions of their quality of care with the widespread use of telemedicine. In this study, we aimed to identify the proportion of patients who received telemedicine versus in-person appointments during the pandemic, and the number who required in-person follow-up after a phone consultation. In addition, we aimed to identify patient perceptions of their health care experience via telemedicine versus an in-person appointment. With this information, in conjunction with current technological capabilities of health care delivery, we aim to inform the projected need for telemedicine and identify potential areas of improvement during and beyond the COVID-19 pandemic. From a policy and technology perspective, we believe this information could help improve the delivery of health care, both locally and remotely, thereby improving access to primary care across Canada.

## Methods

We conducted a single-centre prospective study of patients who presented to a multiphysician primary care office in Langley, BC, from 1 November 2020 to 15 February 2021. Approval for this study was granted by the University of

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British Columbia's Behavioural Research Ethics Board (H20-02844). A comprehensive list of all patients who presented to the clinic was collected and eligible individuals received an encrypted survey link sent by an independent medical office assistant. Patients were included if they were 18 years of age or older, had booked a telemedicine or in-person appointment, or were asked to follow up in person after a telemedicine consultation. Appointment type was determined together with the patient, with the option for in-person follow-up after a telephone appointment if it was required (i.e., for a physical exam). Patients were not included if they required an in-person visit for routine newborn and/or cancer screens, needed an in-person COVID-19 swab, or were asked to proceed directly to the emergency department following a telemedicine appointment.

The survey was voluntary and was anonymized and distributed using the Qualtrics survey tool. Questions were based on the Primary Care Patient Experience Survey developed by Health Quality Ontario, which was pilot tested in 2015. The survey was built upon and adapted to a digital survey format.<sup>6</sup>

Descriptive statistics and nonparametric tests were used to analyze the data. Satisfaction parameters were averaged and subjected to Wilcoxon signed-rank testing between the telemedicine and in-person cohorts ( $\alpha = 0.05$ ). A Likert rating scale from poor (corresponding value of 1) to excellent (5) was used in the survey. Additionally, common themes between the telemedicine and in-person cohorts were analyzed based on open text responses within the survey.

## Results

### Patient demographics

In total, 777 individuals were contacted to participate in the study; 426 completed the survey (54.8%). The mean age of respondents was 61.4 years ( $\pm$  SD 16.5), and most were female (65.4%). Most patients (49.1%) self-reported their overall health as good. Over the previous year, 2.8% had not seen their doctor, 25.5% had seen their doctor twice, and 23.1% had seen their doctor five or more times. In terms of appointments, 49.8% were telemedicine, 45.5% were in-person, and 4.7% were telemedicine

followed by in-person assessment. Because only 20 individuals (4.7%) were asked to return for an in-person appointment following a telemedicine consultation, data on this group were not analyzed because they were considered negligible.

**This study demonstrated that the quality of care and satisfaction of patients across both platforms [in-person and telemedicine] are similar.**

### Patient satisfaction

Most individuals (48.4%) felt they had excellent Internet/cellular connection throughout the call; 2.8% had a poor connection. Many rated their comfort when interacting on the call as excellent (44.2%) or very good (35.3%). In addition, 60.9% rated their health information being treated with the level of privacy they expected as excellent.

Most respondents rated their in-person experience as excellent regarding the length of time they waited in the waiting room (57.1%) and the length of time they spent in the examination room prior to seeing the health care provider (42.9%). In terms of their experience with the reception staff, 52.8% rated their experience as excellent, and 31.1% rated it as very good.

Most respondents with in-person visits rated the length of time between making their appointment and their visit as excellent (31.0%) or very good (30.5%); those with telemedicine appointments rated this factor as excellent (28.2%) or very good (50.2%). These results were statistically different based on a two-tailed *t* test ( $P = 0.03$ ). Most respondents felt they had an excellent experience with the last appointment they had: in-person (58.5%) and via telemedicine (56.3%). These results were not statistically different ( $P = 0.49$ ). In terms of the practitioner spending enough time with the patient ( $P = 0.12$ ) and knowing their medical history ( $P = 0.84$ ), most respondents rated their experience as excellent, and there was no statistical difference between the groups.

Overall, 32.3% of individuals had no preference between in-person and telemedicine appointments, whereas 54.9% preferred in-person and 12.8% preferred telemedicine. Individuals commented that physical examination, empathy, two-way communication, and identification of nonverbal cues were particularly good during in-person visits. Telemedicine appointments were considered to provide efficiency, convenience, safety during the pandemic, and time savings for simple things such as prescription refills and follow-ups. Suggestions for telemedicine improvement included providing a video option as opposed to audio only and striving to stick to the original appointment time.

## Discussion

It was difficult to predict how physicians and patients would respond to the new virtual platform of telemedicine given its rapid introduction during the COVID-19 pandemic. This study demonstrated that the quality of care and satisfaction of patients across both platforms are similar.

Historically, telemedicine was used primarily for rural medicine. More recently, it has been implemented in specialty services ranging from cardiology<sup>7</sup> to psychiatry.<sup>8</sup> It has also been used in disaster response<sup>3</sup> and even surgery (telesurgery).<sup>9</sup> Prior to the pandemic, studies demonstrated that telemedicine was equivalent to in-person care across multiple domains. Shigekawa and colleagues found that telemental health and teledermatology were equivalent to in-person care, telerehabilitation was equivalent to or better than in-person care, and teleconsultation was considered a potential alternative to in-person care due to the large scope of care.<sup>10</sup> Furthermore, a systematic review by Kruse and colleagues noted the benefits of telemedicine, such as ease of use, tendency to improve outcomes and communication, and low cost.<sup>11</sup> In addition, telehealth was shown to provide increased access to care, empowerment for patients managing chronic conditions, and improved medication adherence, and led to reduced readmissions.<sup>11</sup> Our study corroborates these findings by highlighting high levels of patient satisfaction with telemedicine for a variety of parameters, including logistics, quality of care, and respectful treatment of

patients. Most of the challenges that prevented implementation of telemedicine prior to the pandemic were related to infrastructure, reimbursement, and policy.<sup>5,11</sup> These barriers were rapidly addressed at the start of the pandemic in order to accommodate a rapidly changing landscape with international social-distancing measures. As more evidence emerges regarding the impact and benefit of telemedicine during the pandemic, these limitations to its use will continue to diminish.

We identified a statistically significant difference between the telemedicine and in-person groups in terms of the time between making an appointment and attending it. Although telemedicine appointments are limited in power, they have demonstrable benefits. Telemedicine can be performed from anywhere, which provides more opportunities for appointments that do not require travel to a clinic. This allows certain types of appointments, such as review of lab and radiology results, follow-up, and issues that do not require a physical exam, to occur in a time-sensitive manner.<sup>12-14</sup> Currently, many physicians are limiting in-person visits in order to reduce zones of infection, which is adding to the delay experienced in the in-person cohort. As the pandemic settles, these restrictions and regulations may ease. However, if this new type of patient flow works well, many patients and physicians may prefer to continue to use telemedicine for most of their clinic appointments. In this case, there is a risk that patients who must be seen in person will experience longer wait times, and those who are uncomfortable with or do not have the means to use telemedicine may be underserved. Therefore, it is important to address potential disparities for those with limited digital access, digital literacy, and English language proficiency, among others.<sup>15</sup>

While many patients in our study preferred in-person visits (54.9%), 32.3% had no preference, and patients rated telemedicine appointments as being equivalent to in-person visits for most of their care. Thus, telemedicine should no longer be a temporary measure that is used during the pandemic; a mixed model should be considered as a permanent solution that can be improved upon to better serve patients. Improving access to marginalized communities should be addressed in conjunction with

improving convenience and privacy for patients and developing billing, workflow integration, and electronic health record interoperability for physicians.<sup>16</sup> There are many possibilities for furthering such care with at-home monitoring devices and the advent of wearable technology.

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As access to digital services continues to expand, it is imperative that physicians and medical learners are trained early on so they feel comfortable and proficient using these innovative technologies.

### Study limitations

Our study was limited by our recruitment and data collection methods. Because participation was voluntary, there is a risk of selection bias—in particular, volunteer bias and nonresponse bias. Given that patients likely have variable risk tolerance during the pandemic and can often choose whether they prefer a telemedicine appointment over an in-person consultation, there is a risk of bias that those who opt for telemedicine start at a place of greater satisfaction. Those patients are very likely to be the same ones who are comfortable with using digital technologies.

### Conclusion

At the start of the COVID-19 pandemic, telemedicine was rapidly introduced into primary care to reduce the risk of infectious disease spread. It was unknown how patients would respond to this and whether care would be effective via telemedicine. Our study suggests that patients' satisfaction with their primary care provider has been very positive during the pandemic, and that telemedicine and in-person consultations are equivalent for most patient

care needs. Moving forward beyond the pandemic, we suggest that a hybrid model of care based on both in-person and telemedicine consultation continue to be used. ■

### Competing interests

None declared.

### References

1. Perednia DA, Allen A. Telemedicine technology and clinical applications. *JAMA* 1995;273:483-488.
2. Shaw J, Jamieson T, Agarwal P, et al. Virtual care policy recommendations for patient-centred primary care: Findings of a consensus policy dialogue using a nominal group technique. *J Telemed Telecare* 2018;24:608-615.
3. Cherry CO, Chumbler NR, Richards K, et al. Expanding stroke telerehabilitation services to rural veterans: A qualitative study on patient experiences using the robotic stroke therapy delivery and monitoring system program. *Disabil Rehabil Assist Technol* 2017;12:21-27.
4. Lurie N, Carr BG. The role of telehealth in the medical response to disasters. *JAMA Intern Med* 2018;178:745-746.
5. Canadian Medical Association. Virtual care in Canada: Discussion paper. 2019. Accessed 12 January 2022. [www.cma.ca/virtual-care-canada-discussion-paper](http://www.cma.ca/virtual-care-canada-discussion-paper).
6. Health Quality Ontario. Primary care patient experience survey: Support guide. 2015. Accessed 12 January 2022. [www.hqontario.ca/Portals/0/documents/qj/primary-care/primary-care-patient-experience-survey-support-guide-en.pdf](http://www.hqontario.ca/Portals/0/documents/qj/primary-care/primary-care-patient-experience-survey-support-guide-en.pdf).
7. Kuehn BM. Telemedicine helps cardiologists extend their reach. *Circulation* 2016;134:1189-1191.
8. Doarn CR. Telemedicine and psychiatry—A natural match. *mHealth* 2018;4:60.
9. Asiri A, AlBishi S, AlMadani W, et al. The use of telemedicine in surgical care: A systematic review. *Acta Inform Med* 2018;26:201-206.
10. Shigekawa E, Fix M, Corbett G, et al. The current state of telehealth evidence: A rapid review. *Health Aff* 2018;37:1975-1982.
11. Kruse CS, Krowski N, Rodriguez B, et al. Telehealth and patient satisfaction: A systematic review and narrative analysis. *BMJ Open* 2017;7:e016242.
12. Silver SL, Lewis MN, Ledford CJW. A stepwise transition to telemedicine in response to COVID-19. *J Am Board Fam Med* 2021;34(suppl):S152-S161.
13. Scott SN, Fontana FY, Züger T, et al. Use and perception of telemedicine in people with type 1 diabetes during the COVID-19 pandemic—Results of a global survey. *Endocrinol Diabetes Metab* 2020;4:e00180.
14. Novara G, Checucci E, Crestani A, et al. Telehealth in urology: A systematic review of the literature. How much can telemedicine be useful during and after the COVID-19 pandemic? *Eur Urol* 2020;78:786-811.
15. Samuels-Kalow M, Jaffe T, Zachrisson K. Digital disparities: Designing telemedicine systems with a health equity aim. *Emerg Med J* 2021;38:474-476.
16. Lin S, Sattler A, Smith M. Retooling primary care in the COVID-19 era. *Mayo Clin Proc* 2020;95:1831-1834.