



# A Quantitative and Qualitative Study on Patient and Physician Perceptions of Nephrology Telephone Consultation During COVID-19

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## Abstract

**Background:** COVID-19 required rapid adoption of virtual modalities to provide care for patients with a chronic disease. Care was initially provided by telephone, which has not been evaluated for its effectiveness by patients and providers. This study reports patients' and nephrologists' perceptions and preferences surrounding telephone consultation in a chronic kidney disease (CKD) clinic.

**Objective:** To evaluate patient and physician perspectives on the key advantages and disadvantages of telephone consultations in a nephrology out-patient clinic setting.

**Design:** Cross-sectional observational survey study.

**Setting:** General nephrology clinic and a multidisciplinary kidney care clinic in London, Ontario, Canada.

**Participants:** Patients with CKD who were fluent in English and participated in at least one telephone consultation with a nephrologist during the COVID-19 pandemic.

**Methods and measurements:** Nephrologists' and participants' input facilitated the development of both patient and nephrologist surveys. Participants provided self-reported measures in 5 domains of satisfaction: user experience, technical quality, perceived effectiveness on well-being, perceived usefulness, and effect on interaction. Nephrologists provided self-reported measures within 6 categories: general experience, time management, medication changes, quality of care, job satisfaction, and challenges/strengths. Descriptive statistics were used to present data. Content analysis was performed on 2 open-ended responses.

**Results:** Of the 372 participants recruited, 235 participated in the survey (63% response). In all, 79% of the participants were  $\geq 65$  years old and 91% were white. Telephone consultation was a comfortable experience for 68%, and 73% felt it to be a safer alternative during the pandemic. Although 65% perceived no changes to health care access, most reported spending less time and fewer resources on transit and parking. Disadvantages to telephone consultation included a lack of physical examination and reduced patient-physician rapport. Eleven of 14 nephrologists were surveyed, with most reporting confidence in the use of telephone consultation. Physician barriers to telephone consultation included challenges with communications and lack of technology to support telephone clinics.

**Limitations:** Our survey included a majority of older, white participants, which may not be generalizable to other participants particularly those of other ages and ethnicity.

**Conclusion:** Although both patients and nephrologists adapted to telephone consultations, there remain opportunities to further explore populations and situations that would be better facilitated with an in-person visit. Future research in virtual care will require measurement of health care outcomes and economics.

**Trial registration:** Not applicable as this was a survey.

## Keywords

COVID-19, patient satisfaction, physician survey, telemedicine, telenephrology

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## What Was Known Before

Before the COVID-19 pandemic, telemedicine has facilitated the provision of care in select settings, while decreasing direct and indirect costs of care. The widespread acceptability of telemedicine has been varied due to funding models and limitations in technology.

## What This Adds

During the pandemic, use of telephone consultation for patients with chronic kidney disease (CKD) provided a safe, timely, and cost-effective alternative to in-person visits and was well accepted by both nephrologists and patients. Elderly patients with mobility issues especially benefited from the convenience of telephone consultation. Lack of physical examinations and, in some situations, challenges with communications were identified as weaknesses, and some patients prefer the in-person visits. Further expansion into virtual care will require careful navigation, engaging all stakeholders, and including patients to ensure optimal care is provided within a quadruple aim approach.

## Introduction

The COVID-19 pandemic required an urgent pivot from traditional office visits to alternate models of clinical care. Telemedicine, as traditionally defined by the World Health Organization (WHO), is the adoption of information and communication technology (ICT) to provide more accessible care in diagnosing, treating, and preventing diseases.<sup>1</sup> During the pandemic, telemedicine provided the opportunity for clinicians to maintain continuity of care while following social distancing rules and reducing the risk of contracting or spreading COVID-19.<sup>2</sup> Continuity of care is important for patients with chronic kidney disease (CKD), as many of them have other chronic conditions requiring regular assessment, laboratory monitoring, and education regarding disease management and treatment choices.<sup>3</sup>

In the past, widespread implementation of telemedicine was hindered by limited reimbursement, legal risks of telemedicine licensure and credentialing, and lack of comfort using technologies by both patients and providers.<sup>4</sup> Many of these barriers have since been removed with changes to fee schedules, technology, and modifications of expectations among patients and health care providers.<sup>5,6</sup> With these changes, the transition to a virtual platform during the

pandemic has permitted care to continue, ensuring the safety of patients and health care providers while addressing patient needs.<sup>7</sup> At the pandemic's peak in April 2020, telemedicine was responsible for 77% of all ambulatory visits in Ontario, Canada, where 90% of telemedicine visits were conducted by telephone.<sup>8</sup>

The implementation of technology to support patient care in nephrology has resulted in high satisfaction among patients and providers.<sup>9-13</sup> When rapidly transitioning to technology-based solution like phone consultations during the pandemic, it is important to assess the impact of the chosen method while ensuring there are no unintended consequences across multiple dimensions. The Quadruple Aim is a framework used by health care institutions for evaluating quality of care and patient satisfaction through 4 dimensions: patient experience, provider experience, cost, and population health. This study examines the effectiveness of telephone consultation during the COVID-19 pandemic across 2 of these measures, patient experience and provider experience with reference to costs using surveys and qualitative questions.

## Methods

### Survey Items

A literature review and nephrologist and patient input facilitated the development of both patient and nephrologist surveys. Questions were formatted to align with the 5 domains for assessing patient perspective surrounding telemedicine, which were adapted from Langbecker et al.<sup>14</sup> (Table 1). Responses were scored on a 5-point Likert scale, where higher scores indicated a higher level of satisfaction. Extremes and middle response options were labeled to enhance clarity. Respondents also provided further insight into the advantages and disadvantages of telephone consultation through 2 open-ended questions. The survey and Letter of Information and Consent were sent by postal mail or email on a secure link (REDCap) as per patient preference. A follow-up survey was sent out approximately 2 months after the first request.

The physician survey examined general experience, time management, medication changes, quality of care, job satisfaction, and challenges/strengths of telephone consultation. It was distributed via email on a secure link (Qualtrics) in June 2021. All nephrologists were followed up 1 week after the first request. All survey responses were collected with

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**Table 1.** Patient-Level Constructs to Measure Outcomes of Phone Consultations Adapted From Langbecker et al.<sup>14</sup>

Theme	Definition	Question variable
General experience	Evaluation of user's subjective experience of phone consultations (eg, level of patient-centeredness)	<ul style="list-style-type: none"> <li>• Patient-centeredness</li> <li>• Comfort</li> </ul>
Technical quality	Subjective evaluation of the quality of the technology used	<ul style="list-style-type: none"> <li>• Reliability</li> <li>• Ease of use</li> </ul>
Perceived effectiveness	Subjective assessment that a phone consultation helped improve the health status or well-being of a patient	<ul style="list-style-type: none"> <li>• Measures of health or well-being</li> <li>• Patient empowerment</li> <li>• Diagnostic confidence</li> </ul>
Perceived usefulness	Subjective assessment that a phone consultation produced some benefit or met the purpose of the consultation	<ul style="list-style-type: none"> <li>• Cost consequences</li> <li>• Time consequences</li> <li>• Accessibility</li> <li>• Effect on continuity of care</li> <li>• Future intention to use</li> <li>• Willingness to use/practice</li> </ul>
Effect on interactions	Subjective assessment of how the modality of communication affected patient-clinician interaction	<ul style="list-style-type: none"> <li>• Communication style</li> <li>• Ease of communication</li> </ul>

implied consent and were anonymous, without the inclusion of any personal health information or other identifiers. This study was approved by the Western University Research Ethics Board (115970).

### Study Population

Participants were enrolled between December 2020 to April 2021 from the general nephrology clinic and a multidisciplinary care kidney clinic. The multidisciplinary care kidney clinic supports patients with a higher risk of needing dialysis and engages the support of a case manager, dietician, social worker, and pharmacist. Participant inclusion criteria required age  $\geq 18$  years, written and verbal fluency in English, participation in in-person visits before the COVID-19 pandemic, and at least 1 nephrology telephone consultation during the pandemic. Nephrologists were fully licensed consultants who ran at least 1 clinic for patients with CKD and transitioned to telephone consultation during the pandemic. Most nephrology clinics were conducted by telephone at the time of the study.

Through convenience sampling, nephrologists identified participants who showed interest in participating in the survey during their telephone consultations and shared the participants' names with the study coordinator, who subsequently further explained the study and obtained verbal consent to send the survey by postal mail or email.

### Statistical Analysis

Descriptive statistics were used to summarize participant characteristics, experience, technical quality, perceived effectiveness, perceived usefulness, and effect on interactions. Descriptive statistics were used to summarize nephrologist responses to general experience, time management, medication changes, quality of care, job satisfaction, and

challenges/strengths of telephone consultation. Responses to these categorical variables were summarized as percentages. Comments from 2 open-ended questions were examined using an inductive qualitative analytical approach.<sup>15</sup> Two research members (S.H.L. and S.R.) independently performed close readings of the comments and manually derived themes, where thematic development was directed by the content of the data. Through team consensus, the most important themes were chosen and representative quotes were selected for each theme.

## Results

### Patient Survey

The survey was sent to 372 participants who verbally agreed to participate. In all, 235 responses were returned (63%). Most respondents were men (60%), white (92%), 65 years or older (77%), and not in the labor force (80%). English was the first language in 93% of respondents (Table 2). Between April 2020 and March 2021, the patient population in nephrology clinics were an average of 65.7 years old ( $\pm 17.0$ ), men (57%), and white (83%).

Participant perceptions are presented in Supplementary Material 1 using the Likert scale. We report on the 5 domains for assessing participant perspectives on telephone consultations. (1) General experience: 68% of participants (158/231) felt very comfortable with telephone consultation. Participant's experience with the health care was generally positive, where 77% (170/221) felt very comfortable with the medication review and 67% (155/229) felt the physicians were able to address questions and concerns equally well compared with in-person visits. (2) Perceived effectiveness on health status: 74% (165/224) felt very safe from the pandemic through telephone consultation. Participants felt very comfortable with self-reporting their blood pressures (74%,

**Table 2.** Patient Demographics.

Characteristic	N (%)
Age (years)	
18-34	2 (1)
35-44	6 (2)
45-64	47 (20)
65 and above	180 (77)
Sex	
Men	141 (60)
Women	94 (40)
Ethnicity	
White	216 (92)
Black, Asian, Hispanic, Other	19 (8)
Employment status	
Employed	38 (16)
Not in labor force	189 (80)
Unemployed, other	8 (4)
English as first language	
Yes	219 (94)
No	15 (6)

151/203) and weights (73%, 144/198) from home. Also, 43% (85/200) felt that preferences were fully considered when deciding health needs and 78% (171/219) participated in decision-making with the nephrologist in a similar manner as in-person visits. (3) Perceived usefulness of telephone consultation: Most participants spent much less time (75%, 161/216) and financial resources for traveling (75%, 154/206) and waiting at the clinic (43%, 98/229). Participants also did not perceive a noticeable change in booking follow-up appointments (63%, 133/210) and access to health care (65%, 150/230) through telephone consultation compared with in-person clinics. (4) Technical quality of telephone consultation: 70% (154/221) experienced minimal technical difficulties and 68% (155/227) required no help from friends or family. Also, 59% (109/184) felt that the ease of obtaining prescriptions from the nephrologist was similar between telephone consultation and in-person visits. (5) Telephone consultation's effect on interaction: 55% (126/231) of participants felt the information given by the nephrologist was as clear and understandable as compared with the in-person clinics, and 68% (155/229) felt it was just as easy to speak to the nephrologist about their concerns as in-person clinics.

Telephone consultation was most preferred by 44% (104/234) of participants while in-person visits were most preferred by 37% (88/234) of participants. Video camera was most preferred by 9% (22/234). A mix between telephone consultation and in-person visits was most preferred by 9% (20/234).

In all, 234 participants provided comments about the advantages and disadvantages of telephone consultation visits (Table 3). Themes regarding advantages of telephone consultation included the perceptions of safety and convenience of telephone consultation as participants felt less anxious

about having to enter the hospital during the pandemic and favored telephone consultation due to reduced need for travel, parking, and waiting at the clinic. However, participants were more willing to meet in-person when their symptoms become more severe or a change in medical needs was warranted. Themes regarding disadvantages had to do with lack of clarity of information, developing connections and trust with nephrologists, lack of the physical examination, and the impersonal component of telephone consultation. Some participants prefer to meet a new nephrologist in-person for the initial consultation to create a more "comfortable" rapport. Inclusion of video modality was suggested by some participants to provide visual cues for physical examinations and more personable interactions with the nephrologist (Table 3). However, most participants were satisfied with the telephone consultation and expressed that no improvements were needed.

### Physician Survey

A survey was distributed to the nephrologists involved in the telephone consultation clinics. The response rate was 79% (11/14), 64% of whom have been practicing nephrology for 10 to 20 years. Prior to the COVID-19 pandemic, nephrologists used virtual modalities such as video (Ontario Telemedicine Network), telephone, email, and text/instant messages in less than 10% of their clinic visits. The use of telephone clinics increased significantly during the pandemic to between 50% and over 90% of patient visits (73%, 8/11). The confidence level of most nephrologists increased to "very confident" with the usage of telephone consultation during the pandemic in comparison with before the pandemic began (Figure 1). Nephrologists also noted less time spent with each participant during a telephone consultation (55%, 6/11), increased need for administrative support (64%, 7/11), and similar or increased no-shows for the clinic appointment (64%, 7/11). There was uncertainty on whether telephone consultations were more efficient than in-person clinics and confidentiality was not felt to be significantly different between in-person and telephone consultation for most nephrologists (73%, 8/11).

Nephrologist perspectives on factors influencing effectiveness of telephone consultation are listed in Supplementary Material 2. Notable challenges included the inability to examine participants, inaccessibility of outpatient blood work, and challenges with prescribing new medications, which required laboratory, weight and blood pressure monitoring, and when providing education. Nephrologists had slightly less confidence in the patients' own management of their chronic disease at home (73%, 8/11). Language barriers and patient hearing impairments were also regarded as barriers to accessing patients in telephone consultation. Moreover, nephrologists reported decreased job satisfaction (64%, 7/11) and a diminished sense of connection with patients (100%, 10/10) when using telephone consultation.

**Table 3.** Themes Surrounding the Advantages and Disadvantages of Phone Consultations and How They Can Be Improved.

Theme	Comment	Sex	Age	Ethnicity
Perceptions of safety	Being slightly disabled, it was difficult going to the clinic and it gave me anxiety. I also had to take a cab to and from.	Female	45-64 years	White
	I like I didn't have to come to hospital during the pandemic, saved parking fees and worrying if the weather was going to be bad as I live 25 miles away.	Female	65 years or above	White
Convenience	... I did not have to go out of the house, pay for parking, etc. It was more convenient as I was able to continue my day until the Dr called. I felt quite at ease that I was able to ask questions.	Female	65 years or above	White
	It saves me the cost, time, and inconvenience of driving to and from the hospital, the cost of parking, and the long walk from the parking lot to the doctor's office.	Male	65 years or above	White
	What I like is you just wait for the doctor's call and discuss your diagnosis. If nothing is wrong, you save a trip to the clinic and the parking fee.	Female	65 years or above	White
Clarity of information	If there were physical changes in my condition, I would rather attend the physical clinic with the MD. So that she could see the changes, such as swelling in my legs or listening to my chest.	Male	35-44 years	White
	I like the in-person visits because sometimes you have to show a concern to the physician that isn't easy to explain over the phone.	Female	45-64 years	White
	... Did not like the fact that the doctor cannot see me. Doctor [cannot] detect a physical condition that has to be treated which [is] not obvious to the patient.	Male	65 years or above	White
Developing connections	I like in-person because you are able to articulate your concerns and read the doctor's reaction.	Male	65 years or above	African American
	Much prefer seeing my clinical doctors in-person. Medical phone conversations tend to be one sided and vague.	Male	65 years or above	White
	I think it's important to see the person one is talking to. Non-verbal cues are important for both the doctor and patient.	Female	65 years or above	White
Developing trust	... for my first appointment with the doctor, I would have preferred in-person or virtual video appointment.	Female	45-64 years	White
	I already had a comfortable rapport with the current doctor. In other circumstances, I would still prefer in-person if I was seeing a new doctor.	Male	65 years or above	White
Implementing video function	... important to see your doctor even if it's online. You feel more secure in their replies and concerns. You can see if they are trying to rush you out.	Male	65 years or above	White
	... Zoom or Facetime where the physician can observe the patient to look for symptoms, reactions, etc.	Male	65 years or above	White

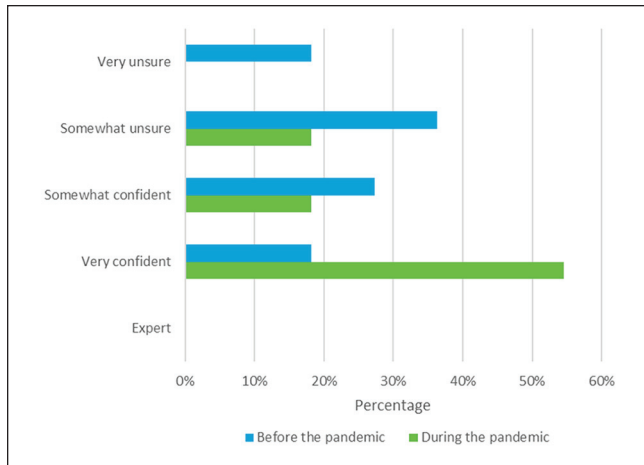
In terms of strengths, most nephrologists felt telephone consultation increased accessibility for patients, especially elderly patients (64%, 7/11) and patients with physical disabilities (82%, 9/11). Greater accessibility to health care was viewed as a significant overall strength to telephone consultation. The nephrologists anticipated seeing between 31% and 50% of patients virtually post-COVID.

## Discussion

Our study provides a systematic approach to examining the impact of telephone consultation in caring for patients with CKD from both a patient and nephrologist perspective. Patients were very comfortable with telephone consultation and felt their concerns and preferences were addressed

equally well compared with in-person visits. Most patients preferred telephone consultation due to less time spent on waiting and traveling to the clinic and less financial resources spent on parking. Patients who preferred in-person visits felt that telephone consultation limited the development of interpersonal connection with nephrologists and clarity of physical changes in health conditions. Nephrologists felt that increased accessibility of care for patients who were older or had physical disabilities was telephone consultation's greatest strength. However, telephone consultation as currently implemented precluded proper physical examination, monitoring, and education of patients, leading to somewhat less confidence in patient self-management at home. Nephrologists also reported less job satisfaction and sense of connection with patients. Neither patients nor nephrologists





**Figure 1.** Confidence with the use of virtual care before versus during the pandemic (n = 11).

encountered significant technical difficulties or showed concerns about confidentiality during telephone consultation visits. Telephone consultation has been widely adopted as a safe option for receiving care during the pandemic, including patients with CKD.<sup>16</sup> In the past, the implementation of virtual modalities has been constrained by laws and regulations at varying institutional levels in Canada.<sup>17</sup> Satisfaction with virtual care before the pandemic has also been influenced by self-selection bias.<sup>18</sup>

The need for travel and parking were primary reasons for patient preference for telephone consultation, contributing to its favorable perceptions of usefulness and effectiveness. The cost effectiveness of virtual modalities in clinical care and its subsequent observed benefits to patient well-being have been widely noted in rural areas.<sup>4,9</sup> Evidence suggests that higher hospitalization rates and higher rates of mortality are seen in geographically isolated patients with CKD compared with those living closely to a renal clinic.<sup>19,20</sup> In the United States, for example, a vast majority of nephrologists reside in urban cities, leaving many rural regions underserved.<sup>4</sup> Second, patients with CKD living farther from a kidney clinic become less adherent to clinical visits and thus receive less CKD treatment.<sup>21</sup> Telemedicine minimizes patient travel and maximizes access to care, which is especially helpful for patients with mobility issues. Continued use of telemedicine may be a more effective and convenient way of addressing geographic isolation, physical limitations, and maintaining continuity of care while lessening the spread of COVID-19 during and after the pandemic.<sup>4,9,16</sup>

Nephrologists' confidence in using telephone consultation to conduct their clinics significantly improved during the pandemic. They felt that telephone clinics were largely more accessible, particularly for patients with disabilities and the elderly with no need for assistance with travel and parking. This aligns with the perspective of our patients and

past studies showing nephrologists' belief in the larger role that virtual care will play in health care.<sup>22</sup> A lack of confidentiality was not reported as a significant barrier to the use of telephone consultation, which is in contrast to findings by Albarrak et al who found that a concern for patient privacy was one of the main reported issues with adopting telemedicine.<sup>22</sup> In our study, language barriers, hearing impairment, and inability to physically examine patients were most commonly perceived by nephrologists as barriers to telephone consultation. This perspective is supported by a study of 351 patients with cancer, who found the most important element to receive information about their health was related to content, including the physician's knowledge or competence.<sup>23</sup> Consequently, removing communication barriers is a top priority for nephrologists to facilitate effective virtual clinics, which could be addressed through standardized training and investing in better equipment.<sup>24</sup>

Although telephone consultations appear to be a more efficient use of time for patients, nephrologists had conflicting perceptions on whether or not this translated to greater efficiency in the clinic. Many found it harder to book follow-up appointments, somewhat harder to obtain diagnostic testing, and required somewhat more administrative support. Management continuity as described by Reid et al as "the provision of timely and complementary services in a shared management plan" is arguably at stake with telephone consultation where there is fewer access to requisitions and on-site multidisciplinary services.<sup>25</sup> Therefore, what is seen as an efficient one-time service by patients may not be efficient overall when follow-up and monitoring are taken into account. These may speak to institutional challenges that have not yet adapted well to virtual modalities, as most of our nephrologists have only recently become confident with implementing telephone consultation. Incorporating training curricula surrounding virtual care could be a worthwhile long-term investment, as better efficiency has shown a reduced use of health resources and decreased cost to health care services.<sup>26</sup>

Despite the positive reception with telephone consultation, one-third of patients preferred in-person visits. The main barrier was the absence of non-verbal communication, illustrating the importance of visual cues (eg, eye contact, smiling, body language) in nurturing a good relationship with a nephrologist.<sup>27</sup>

Prior studies also align with our finding that patients prefer telephone consultation if they have an already established relationship with the nephrologist.<sup>28</sup> Our patients did not prefer to meet a new nephrologist through telephone consultation. In addition, patients felt that visual cues or physically being with the nephrologist strengthened the clarity of their medical condition, especially if it changes. A study showed success with using mobile health application for patients with burn injuries, which traditionally required physical examination.<sup>29,30</sup> The less favorable effects of

telephone consultation are significant for nephrologists in job satisfaction, which encompasses connection to patients and confidence in patients' management of their disease. The negative impact of telemedicine on the patient-physician relationship and empathic communication has been the primary concern for physicians in many past studies, where further research on the factors influencing acceptability of telemedicine is still needed.<sup>23,31</sup> Until pandemic restrictions lift, nephrologists must develop new skills in building trust and empathy using virtual care platforms.

Although the visual component to video conferences has a distinct advantage over telephone consultations, only 9% of patients expressed a preference for this. Thus for older patients with low technical literacy yet strong preference for visual cues, in-person visits remain the gold standard especially for more emotionally charged and medically challenging consultations dealing with acute illness.<sup>18</sup> For providers, video conferences can enhance patient-physician rapport, improve confidence with treatment decisions, and lower the perceived risk of misdiagnosis compared with first-time phone visits. For follow-up appointments, telephone and video conferences were perceived to be equally effective in caring for patients with chronic disease, lending to the possibility of a mixed communication method in telephone consultation.<sup>31</sup> However, it is uncertain how telephone or video conferences affect care and medical outcomes compared with in-person visits, which warrants further investigation. In addition, the ability to use video conferences requires greater technical literacy and Internet resources, which will heavily depend on a patient's and nephrologist's level of training, adaptability, and familiarity with ICT.<sup>31,32</sup>

### Limitations

The study has several limitations. First, many of our questions required patients to recollect their experiences with in-person visits prior to the pandemic. Recall bias may have influenced the responses, and a more controlled comparison with in-person visits should be pursued after restrictions associated with the pandemic lift. As the study population only included CKD clinics in London serving patients in the Southwestern Ontario region, our results are not generalizable to the overall Canadian population especially in urban areas. Our recruitment process may have reduced the sample diversity, in age, language, and ethnicity. As such, this study did not capture experiences of younger patients with CKD and those from underrepresented minorities who may face language or health literacy barriers. In addition, we did not collect detailed demographic data such as literacy level, income, comorbidities, and health status that may correlate with patient satisfaction. To keep the data anonymous, patient-specific solutions cannot be proposed in this study. Finally, our Likert-based satisfaction survey was not derived from an

already validated questionnaire, affecting the validity of the results. A new survey tool was developed to highlight the differences between telephone consultation and face-to-face clinics during the COVID-19 pandemic.

### Conclusion

Patients with CKD and nephrologists perceived care through telephone consultation favorably, acknowledging there is still a role for in-person visits to build relationships, perform a physical examination, and provide clearer information on their health conditions. Telephone consultation is regarded as a more time- and cost-efficient alternative to meeting a nephrologist in-person, allowing increased accessibility to care. Future studies will explore preferences among diverse populations and needs and a measurement of the quality and cost of care.

### Ethics Approval and Consent to Participate

The study was approved by the Western University Research Ethics Board (115970).

### Consent for Publication

Not applicable because there is no patient identifying information in this manuscript.

### Availability of Data and Materials

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.


### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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### Supplemental Material

Supplemental material for this article is available online.

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