



## “I Hope it will Continue after the COVID-19 Era”. Telemedicine during the COVID-19 Pandemic

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### Abstract

**Objective:** The primary objective of this study is to quantify patient satisfaction in telemedicine visits during infertility care.

**Design:** This study utilizes a cross-sectional survey design where electronic surveys were sent to all patients who received care through a telemedicine appointment.

**Setting:** Academic affiliated, infertility clinic in Omaha, Nebraska.

**Patients:** All patients utilizing telemedicine for infertility care.

**Interventions:** Patients were sent a link for the survey.

**Main outcome measure(s):** Overall telemedicine rating was measured on a 5-point Likert type scale ranging from 1= “extremely satisfied” to 5= “extremely unsatisfied”. Frequencies of demographic characteristics and survey responses were calculated. Kruskal-Wallis H test was used for nonparametric ordinal data to determine statistical significance between subgroups of 3 or more categories. Mann-Whitney U test was used to allow for comparisons between dichotomous categorical groups.

**Results:** A 95.5% felt extremely satisfied or satisfied with their care. Home distance from clinic, length of time trying to conceive, previous in-person visit at the clinic, previous experience with video conferencing software, and whether the patient was alone or accompanied during their telemedicine visit were not significantly correlated with patient satisfaction of their telemedicine appointment. Overall satisfaction scores were significantly different based on patient age group.

**Conclusion:** It is imperative that we continue to modify practice patterns to allow for smooth integration of telemedicine within our practice while maximizing patient satisfaction. While many continue to prefer in-person visits, providers should continue to offer telemedicine options for patients despite relaxation of restrictions from the COVID-19 pandemic.

**Keywords:** Telemedicine; Infertility; COVID-19; Patient satisfaction

### Lay Summary

With the COVID-19 pandemic, many aspects of our lives were adjusted to accommodate the new need for social distancing. In particular, delivery of medical care was radically altered. Patient satisfaction in telemedicine has previously been evaluated. However, patient satisfaction within the infertility population has not been addressed. The objective of this study is to evaluate patient satisfaction in telemedicine visits during infertility care. Patients who received care at an infertility clinic were sent a link to an electronic survey following their telemedicine visit. Their satisfaction with their telemedicine visit was evaluated. 95.5% of respondents felt extremely satisfied or satisfied with their care. There was no correlation between satisfaction and home distance from clinic, length of time trying to conceive, or previous in-person visit at the clinic. It is imperative that we continue to modify practice patterns to allow for smooth integration of telemedicine within our practice while maximizing patient satisfaction.

### Introduction

During the COVID-19 pandemic, telemedicine has become a routine part of the care that many physicians provide. Telemedicine has previously been defined as “the use of electronic information

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and telecommunications technologies to support and promote clinical healthcare when the participants are separated by a distance” [1]. Ability to participate in telemedicine requires, at a minimum, four things: Security, privacy, internet service availability, and device availability [2]. The main advantage during the COVID-19 pandemic is that it allows for both patients and clinicians to limit their exposure to the virus. It has been noted that, prior to the COVID-19 pandemic, telemedicine was being used to facilitate care for patients with chronic, debilitating diseases and those who are at increased risk due to immunocompromised status [3]. Prior to the pandemic, the most common reason for utilizing telemedicine was for patients in rural areas to access subspecialty care [4,5]. Telemedicine has also allowed patients that might otherwise not have access to care the ability to see their physician. There has been an approximately four-fold increase in the use of telemedicine from 11% of consumers using telemedicine and 2019 compared to 46% using it now [6]. This uptake in the use of telemedicine is a significant shift in both access and delivery of patient care, and as such, an assessment of patient perceptions is warranted.

While there are many positive aspects to telemedicine, some drawbacks that have been cited include ensuring privacy and HIPPA compliance with visits [1,3,5]. Specific barriers cited affecting patient use of telemedicine have included slow internet speed resulting in poor audio/video quality, finding telemedicine systems difficult to use, perception that providers paid less attention to them, and resistance to technology [2,4]. There has also been concern for increased legal liabilities for physicians and resistance from insurance companies [3]. Medicare and Medicaid had previously only covered telemedicine visits in areas of physician shortages (largely rural areas) and for specific health conditions. This was evident in that uptake of telemedicine services has occurred most rapidly in these areas of favorable reimbursement [5]. During the COVID-19 pandemic, Medicaid and Medicare widely expanded coverage of telemedicine allowing patients and providers more flexibility in healthcare [7].

Pre-pandemic data suggests an overall satisfactory experience with nonfertility telemedicine care [2,8]. Reasons cited for preference of telemedicine have included eliminating patient wait time, travel time, reducing medical and travel expenses, and convenience [1-5,9]. Patient satisfaction within the infertility population, however, has not been specifically addressed. Benefits to using telemedicine in the infertility population, specifically, include the ability to have both the patient and their partner present for visits even if they are not in the same location and the ability to also provide ancillary services virtually [1]. These are reasons why evaluating this population's telemedicine satisfaction separately is of particular interest.

The primary objective of this study is to quantify patient satisfaction in telemedicine visits during infertility care. Secondary outcomes included patient's sense of privacy/security during the visit, ability to ask questions, and respondents desire for use of telemedicine visits in the future.

## Material and Methods

The present study utilized a cross-sectional survey design. After IRB approval, electronic surveys were sent to all patients who received care through a telemedicine appointment at an academic affiliated, private practice, infertility clinic in Omaha, Nebraska. Collection date of surveys occurred from August 5, 2020 to January 9, 2021.

All patients who received care through telemedicine were sent a link for the survey. If care was not provided through telemedicine, a

survey was not sent. If the patient did not speak English or Spanish, a survey was also not sent. Survey links were sent to the patient within 48 hours of their scheduled appointment.

Each survey began with written consent for responses to be used for research purposes. The survey had 37 questions that consisted of a variety of multiple choice, open answer, and “check all that apply” questions. The survey questions were constructed based on prior patient satisfaction studies that are available in the literature but also included subject specific information related to their infertility and prior infertility care. Overall telemedicine rating was measured on a 5-point Likert type scale ranging from 1= “extremely satisfied” to 5= “extremely unsatisfied”. The multiple-choice questions included age, sex, distance from clinic, location during visit, length of infertility, visit type, prior use of and ease of use of the particular video conferencing software used, electronic device used for visit, and length of time on video conference. The survey can be found within the supplemental materials.

Subgroups of interest were chosen based on factors known to impact patient satisfaction as well as additional factors that were thought to potentially impact patient satisfaction in the infertility population, specifically [10]. These included if they were new patients to the clinic, home distance from clinic, patient age, length of time trying to conceive, having had a previous in-person visit at clinic, experience with video conferencing software, and presence of partner or other support person during visit.

Frequencies of demographic characteristics and survey responses were calculated. Kruskal-Wallis H test, also known as the “One-way ANOVA on Ranks”, for nonparametric ordinal data was used to determine statistical significance between subgroups of 3 or more categories, including home distance from clinic, patient and length of time trying to conceive and overall patient rating of telemedicine services. Mann-Whitney U test was used to allow for comparisons between dichotomous categorical groups, including returning patients, previous in-person visit at clinic, and previous experience with video conferencing software and patient rating of telemedicine services. Significance testing was performed with p-value set to 0.05. All data analysis was completed using SPSS version 27.

## Results

A total of 552 survey requests were sent with 7 returning as error. A total of 112 surveys were completed, both in English and Spanish. 95.5% of returned surveys were completed in English. All surveys were completed by women. The greatest proportion of patients were between the ages of 31 and 35 (41.96%), with the second-largest group being 36 to 40 years old (25.89%). Overall, 87.49% of patients were 40 years old or younger. 38% were new patients to the practice. 57% of respondents completed the telemedicine appointment with a partner. Patient demographic characteristics are included in Table 1.

When asked which of the following ways the telemedicine appointment aided you, 73% indicate a reduction in travel time, 68.8% indicate the ability to stay home and 36.6% the ability to stay at work. All respondents felt a sense of privacy and/or security during the appointment. Additionally, all respondents felt there was sufficient time for discussion with the provider and they all felt they could ask questions.

Home distance from clinic ( $H(5)=8.05, p=0.15$ ), length of time trying to conceive ( $H(3)=1.393, p=0.71$ ) (Table 2), whether the patient had a previous in-person visit at the clinic ( $U=1454.000, p=0.62$ ),

**Table 1:** Patient demographic characteristics.

	N (%)
Age	
19-25	7 (6.25)
26-30	15 (13.39)
31-35	47 (41.96)
36-40	29 (25.89)
41-45	13 (11.61)
46-50	1 (0.89)
Language	
English	107 (95.53)
Spanish	5 (4.46)
Location during visit	
Home	92 (82.14)
Work	19 (19.96)
Other	1 (0.89)
Technology used	
Smartphone	33 (29.46)
PC Computer	37 (33.04)
Apple Computer	23 (20.54)
Tablet/ iPad	19 (16.96)
Reason for visit	
New infertility consult	43 (38.39)
Restart infertility consult	14 (12.5)
Plan of care	42 (37.5)
Consents	2 (1.79)
Established patient (30 minute)	6 (5.36)
Other	5 (4.46)
Distance from clinic	
Less than 10 miles	24 (21.43)
10-25 miles	36 (32.14)
26-40 miles	4 (3.57)
41-55 miles	10 (8.93)
56-70 miles	15 (13.39)
More than 70 miles	23 (20.54)

previous experience with video conferencing software ( $U=1136.50$ ,  $p=0.06$ ), and whether the patient was alone or accompanied during their telemedicine visit ( $U=1732.500$ ,  $p=0.11$ ) were not significantly correlated with patient satisfaction of their telemedicine appointment (Table 3).

A 95.5% felt extremely satisfied or satisfied with their experience with telemedicine for infertility care. Overall satisfaction scores were significantly different based on patient age group ( $H(5)=13.155$ ,  $p=0.02$ ) (Table 2). Ad hoc follow-up tests using the Bonferroni adjustment detected the greatest difference between patients aged 19 to 25 and those aged 36 to 40 ( $p$ -value =0.001). The mean difference in overall satisfaction between the 19 to 25 and 36 to 40-year-old age groups was 0.64. Since overall satisfaction was measured on a 5-point Likert type scale, although statistically significant, both groups were “satisfied” with their telemedicine appointment. Of the patients who previously had an in-person visit, 16% would prefer telemedicine for

all visits, 62.5% would like telemedicine for some appointments and 21.4% prefer in-person visits but would use telemedicine if necessary.

Very few patients experienced technical challenges with 2 (1.79%) reporting image and 2 (1.79%) reporting audio issues, 98 (87.5%) found using the video conferencing software “easy” or “extremely easy”. All respondents recommended telemedicine to other women seeking infertility care.

## Discussion

In this study, we evaluated patient satisfaction in telemedicine while undergoing infertility evaluation and management. We also evaluated factors that may compromise patient satisfaction with telemedicine. Patients were overall highly satisfied with using telemedicine for their infertility care. Regardless of demographic characteristics such as age, home distance from clinic, length of time trying to conceive, on average, patients self-reported being at least “satisfied” with their care by telehealth with average scores ranging from a perfect rating of 1 to 1.71.

Appointment type and patient characteristics that might have posed as barriers to effectiveness and perceived satisfaction of telemedicine had no effect on patient ratings of care by telemedicine. The observed visit being the patients first visit (no self-reported history of in-person clinic visits for infertility), having no experience using video conferencing software, and being alone during appointment, did not significantly impact overall self-reported patient satisfaction. No patients reported being “extremely unsatisfied” with their telemedicine appointment, and only 3 (2.68%) reported being “unsatisfied”.

Only 9 patients who had a previous in-person visit reported wanting to use telemedicine services for all visits, however 4 (44.44%) of those patients lived over 70 miles from the clinic. Although the present study did not find evidence of a relationship between satisfaction with telemedicine and rurality of home address, there is evidence that access to telemedicine overall is an important feature for rural patients [5,10,11].

Limitations of this study include small sample size and only female respondents. Overall, the response rate was low at 20.5% which increases the non-response bias of the results. The convenience sample of participants also limits generalizability of results. While the survey link was sent within 48 hours of the visit, given the anonymity of the survey, we were unable to track the length of time between appointment and survey response, possibly leading to recall bias. Only English and Spanish speaking patients were given the survey and a limited number of Spanish surveys were returned. While this ratio is mostly representative of the patient demographics seen at the clinic, it is important to take into account non-English speaking patient satisfaction while changing practice patterns.

## Conclusion

It is imperative that we continue to modify practice patterns to allow for smooth integration of telemedicine within our practice while maximizing patient satisfaction. In this study, almost all patients were satisfied or extremely satisfied with the care they received during their telemedicine appointments. While many continue to prefer in-person visits, providers should continue to offer telemedicine options for patients despite relaxation of restrictions from the COVID-19 pandemic. Telemedicine allows for the opportunity to broaden access to infertility care. There should also be an emphasis on providing

**Table 2:** Overall telemedicine rating by patient characteristic subgroups.

Variable	Sub groupings	Mean score	Standard Deviation	Kruskal-Wallis H	P-value
Age, years	19-25	1.71	0.488	13.155	0.02
	26-30	1.27	0.458		
	31-35	1.34	0.635		
	36-40	1.07	0.258		
	41-45	1.69	1.182		
	46-50	1	0		
Distance, miles	Less than 10	1.33	0.482	8.05	0.15
	10-25	1.11	0.398		
	26-40	1.5	0.577		
	41-55	1.3	0.483		
	56-70	1.33	0.488		
	More than 70	1.61	1.076		
Length of time trying to conceive, years	Less than 1	1.45	0.891	1.393	0.71
	1-3	1.29	0.498		
	3-5	1.13	0.352		
	More than 5	1.29	0.488		

**Table 3:** Overall telemedicine rating by visit characteristic subgroups.

Variable	Mean score	Standard Deviation	Mann-Whitney U	P-value
Previous in-person visit	1.35	0.795	1454.000	0.62
First visit was telemedicine	1.3	0.525		
New patient	1.28	0.591	1431.500	0.68
Return patient	1.35	0.682		
Prior use of software	1.25	0.592	1136.500	0.06
No prior use of software	1.47	0.736		
Alone during appointment	1.21	0.508	1732.500	0.11
Accompanied during appointment	1.4	0.725		

training for providers in practice to maximize their interactions and communication with patients over telemedicine. Also, medical students, residents and fellows should have formal training on telemedicine. In addition, trainees should be involved in telemedicine visits. Areas for future studies include evaluating provider satisfaction with telemedicine as well as comparing outcomes of infertility care in telemedicine vs. in-person visits. Also, further investigation regarding motivating factors for one visit type vs. the other should be pursued. Further advocacy for expanded coverage for the infertility population at large is ongoing but should also include telemedicine visits.

## References

- Berg WT, Goldstein M, Melnick AP, Rosenwaks Z. Clinical implications of telemedicine for providers and patients. *Fertil Steril.* 2020;114(6):1129-34.
- Almathami HKY, Win KT, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: Systematic literature review. *J Med Internet Res.* 2020;22(2):e16407.
- Breen GM, Matusitz J. An evolutionary examination of telemedicine: A health and computer-mediated communication perspective. *Soc Work Public Health.* 2010;25(1):59-71.
- Gordon HS, Solanki P, Bokhour BG, Gopal RK. "I'm Not Feeling Like I'm Part of the Conversation" patients' perspectives on communicating in clinical video telehealth visits. *J Gen Intern Med.* 2020;35(6):1751-8.
- Powell RE, Henstenburg JM, Cooper G, Hollander JE, Rising KL. Patient perceptions of telehealth primary care video visits. *Ann Fam Med.* 2017;15(3):225-9.
- Oleg Bestsenyy GG, Harris A, Rost J. Telehealth: A quarter-trillion-dollar post COVID-19 reality? 2021.
- Medicare Telemedicine Health Care Provider Fact Sheet: Centers for Medicare and Medicaid Services; 2020.
- Polinski JM, Barker T, Gagliano N, Sussman A, Brennan TA, Shrank WH. Patients' Satisfaction with and preference for telehealth visits. *J Gen Intern Med.* 2016;31(3):269-75.
- Hernandez C, Valdera CJ, Cordero J, Lopez E, Plaza J, Albi M. Impact of telemedicine on assisted reproduction treatment in the public health system. *J Healthc Qual Res.* 2020;35(1):27-34.
- Kruse CS, Krowski N, Rodriguez B, Tran L, Vela J, Brooks M. Telehealth and patient satisfaction: A systematic review and narrative analysis. *BMJ Open.* 2017;7(8):e016242.
- Stewart L, Hamilton M, McTavish A, Fitzmaurice A, Graham W. Randomized controlled trial comparing couple satisfaction with appointment and telephone follow-up consultation after unsuccessful IVF/ICSI treatment. *Hum Fertil (Camb).* 2001;4(4):249-55.