ORIGINAL RESEARCH

Synchronous Telemedicine Model in Urogynecology: Are Patients Willing to Continue Telemedicine in the Post–COVID-19 Pandemic Era?

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Importance Following the recent expansion of telemedicine during the COVID-19 pandemic, this remote model of care in female pelvic medicine and reconstructive surgery will likely remain and continue to evolve.
Objective This study was conducted to assess patients' perceptions of and willingness to participate in a synchronous telemedicine visit beyond the COVID-19 pandemic for women with pelvic floor disorders.
Study Design We conducted a cross-sectional study of women who completed a synchronous telemedicine visit from March 16 through May 22, 2020, at a urogynecology practice in an academic medical center. An electronic survey was distributed to women after all telemedicine visits. Demographic data, visit type, and survey responses were analyzed.
Results Two hundred two women received the survey, and 135 women completed it (response rate of 66.8%). The mean age of the respondents was 62.9 ± 16.4 years, and the 3 most common visit diagnoses were overactive bladder (43.7%), stress urinary incontinence (22.2%), and pelvic organ prolapse (21.4%). Most survey participants (88.9%) found that the quality of their telemedicine visits was better than expected, and 89.6% reported that they would like to continue telemedicine care. Our survey showed that 19.4% of women reported difficulty with technology.
Conclusions We found that most women presenting for synchronous telemedicine urogynecology care had a positive visit experience and would continue to use telemedicine for their care. Further developmental work needs to be done on improving the ease of technology as well as availability of telemedicine in the care of women affected by pelvic floor disorders.

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The COVID-19 pandemic and the enactment of the Federal Emergency Act in March of 2020 catalyzed the use of telemedicine.[1–4] With the easing of policy restrictions on the use of telemedicine, many health care systems across the United States redistributed resources to build the necessary infrastructure for virtual care visits. Most health care providers were then mandated to adopt this model to optimize care delivery.[2,3,5–8] Through this process, many clinicians experienced telemedicine care benefits, including cost-effectiveness and shorter visits without sacrificing clinical efficacy and patient satisfaction.[9–11] Previous telemedicine studies have not shown a loss of clinical care quality with virtual delivery.[4,12–14] Furthermore, although telemedicine for female pelvic medicine and reconstructive surgery (FPMRS) is not a novel concept, previous virtual visits have been

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limited to investigational initiatives and rural settings.[12,15–17] With the temporary nature of the Federal Emergency Act, we sought to use this unprecedented time to answer if FPMRS patients believe that synchronous telemedicine care is a desirable alternative for health care delivery beyond the pandemic.

MATERIALS AND METHODS

This study is a cross-sectional survey of patients who completed a synchronous telemedicine visit from March 16, 2020, through May 22, 2020, at an academic FPMRS clinic. We distributed the electronic survey using the REDCap (Research Electronic Data Capture) survey tool to patients who presented for telemedicine visits during the COVID-19 pandemic.

On March 16, 2020, the FPMRS ambulatory in-person clinic underwent a mandated transition to synchronous telemedicine care for all nonurgent patients. The hospital underwent a system-wide implementation of synchronous videoconferencing through the Health Insurance Portability and Accountability Act–compliant platforms. Alternatively, telephone calls without a video connection were used for those patients whose visits could not be completed through video technology. Synchronous visits are a telehealth model between the patient and the clinician designed to occur simultaneously. All patients were encouraged to participate in synchronous video telemedicine care without exceptions. Even those patients who needed in-person follow-up examinations were encouraged to establish care with an initial telemedicine visit. Call-in video or telephone translator services were used for those who needed an interpretation service for their telemedicine visits. In advance of the telemedicine visit, participants received written instructions from our administrative team and phone-based technology support at the time of the visit.

In addition to the survey, we collected basic demographic data and patients' answers to the Pelvic Floor Distress Inventory. Visit information during the study period, including the types and length of the visit and the billing diagnoses, were also collected by reviewing the electronic health record. After the telemedicine visit on the same day, patients were invited to participate in the electronic survey using an automatically generated link. If the participant had more than 1 telemedicine visit during the study period, we included the survey based on her first telemedicine visit experience only. Survey completion was voluntary, and no financial compensation was provided. The survey was specifically designed to assess participants' perceptions of telemedicine use in an FPMRS clinic and their willingness to continue this model beyond the period of social distancing and government recommended restrictions. The perceptions were measured using a 3-point Likert scale ("definitely agree," "somewhat agree," "disagree") by asking participants about their experiences of using telemedicine in FPMRS in similarity to what has previously been reported in prior studies.[8,10,18–20] The survey construction was reviewed by the consortium of 8 FPMRS clinicians in our practice and experts in survey clinical research and the Health Education Project Specialist within the Patient and Family Learning Center at Mass General Brigham to promote straightforward language uses.

Basic descriptive statistics were used to describe the demographics of the response population. Normally distributed continuous data are summarized using means and standard deviations; one variable (distance to the hospital) was skewed and is summarized using a median and interquartile range. Categorical data are summarized with the frequency and percentage of their occurrence. Differences between responders and nonresponders were analyzed using independent *t* tests for continuous data and χ^2 tests for categorical data; the Fisher exact test was used when small cell sizes were present for race/ethnicity analyses. Willingness to continue with telemedicine was recoded to create a binary variable. Participants responding either "yes—with telephone only," "yes—with video," or "yes—with either" to the willingness to continue question were coded as willing to continue. Those responding "no" were coded as unwilling to continue. Those responding "my doctor/nurse practitioner requested me to have an in-person visit the next time" were excluded from analyses using this binary indicator of willingness. The fisher exact test was used to analyze differences in the 8 key perception questions between willing and unwilling participants to continue with telemedicine. All tests were 2-sided, and *P* values less than 0.05 were considered statistically significant. Study data were collected and managed using REDCap hosted at Mass General Brigham health care,[21,22] and analyzed using R version 3.5.2.[23] The study was approved by the institutional review board at Massachusetts General Hospital (Boston, MA).

RESULTS

Characteristics of Patients Participating in Telemedicine

During the study period, 135 of 202 respondents (66.8%) completed the survey. The respondents' mean

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age was 62.9 ± 16.4 years. The majority were White non-Hispanic (85.9%), and 96.3% did not require an interpreter to complete the survey (Table 1). Seventy-six participants (56.3%) were 65 years or older, and 59 participants (43.7%) were younger than 65 years. Most participants (49.6%) used a smartphone, followed by a personal computer (26.7%) for their telemedicine visit. Ninety participants (66.7%) lived within a 20-mile radius of the main hospital in Boston, MA. Although the majority (94.1%) lived within a 100-mile radius of the hospital, 8 participants (5.9%) lived more than 100 miles away, and 5 participants lived more than 500 miles away. The average Charlson Comorbidity Score among all respondents was 2.9 (SD, 2.3). The 5 most common visit diagnoses managed during this period included the following: overactive bladder (43.7%), stress urinary incontinence (22.2%), pelvic organ prolapse (21.4%), genitourinary syndrome of menopause (20.0%), and pessary care (13.3%) (Table 1).

Responders Versus Nonresponders

Responders were more likely to be White compared with nonresponders ($P = 0.03$). There were no differences in age, visit type (consult or established), or primary visit diagnoses (28% of new consult and 71.9% of established follow-up patients responded to the survey $P > 0.67$) between responders and nonresponders. There was also no difference between responders and nonresponders whether the virtual visit was performed during the early stages of the telemedicine care implementation.

Patient Perceptions of Telemedicine Care in FPMRS

Most participants (88.8%) found that the telemedicine visit's overall quality was better than expected (29.1% definitely agreed) (Fig. 1). Furthermore, 96.2% of participants thought telemedicine decreased travel time and waiting time (87.3%), in addition to allowing them to spend more time with their health care providers (70.9%).

Despite the overall excellent patient experience, 19.4% of participants reported difficulty with technology, and 9.7% reported difficulty finding a private place to have the visit. Among the reasons for unwillingness with the telehealth platform, 26.9% of respondents reported that they missed the in-person interaction with ancillary office staff members, and 15.7%

TABLE 1. Characteristics of Survey Respondents

Characteristics	n = 135
Age, y*	62.9 (16.5)
Age ≥65	76 (56.3)
Age <65	59 (43.7)
Charlson Comorbidity Score*	2.71 (2.3)
Race	
White	116 (85.9)
Interpreter used to complete the survey	
Yes	5 (3.7)
No	130 (96.3)
Non-White	19 (14.1)
Encounter type	
Consult	38 (28.1)
Established follow-up	97 (71.9)
Mode of telemedicine	
Video technology	78 (57.8)
Telephone technology	57 (42.2)
Device used	
Smartphone	67 (49.6)
Personal computer	36 (26.7)
Nonsmart phone	24 (17.8)
Personal tablet	8 (5.9)
Distance to the main hospital	
Within 20 miles	90 (66.7)
20–100 miles	37 (27.4)
100–500 miles	3 (2.2)
Greater than 500 miles	5 (3.7)
Prior exposure to telemedicine	
Yes	58 (43.0)
No	77 (57.0)
Visit diagnoses†	
Overactive bladder	59 (43.7)
Stress urinary incontinence	30 (22.2)
Pelvic organ prolapse	29 (21.4)
Genitourinary syndrome of menopause	27 (20.0)
Pessary care	18 (13.3)
Postoperative visit within 8 wk	17 (12.6)
Recurrent urinary tract infection	16 (11.9)
Long term (6 mo–3 y) postoperative follow-up	14 (10.4)
Constipation	12 (8.9)
Pelvic pain	12 (8.9)
Preoperative evaluation	3 (2.2)
Sex dysphoria	3 (2.2)
Others (1 occurrence each)‡	3 (2.2)

Data reported in as number (percentage) unless indicated otherwise.

*Mean (SD).

†Includes all diagnoses used for billing of the visit.

‡Abnormal uterine bleeding, lichen sclerosis, wound breakdown.

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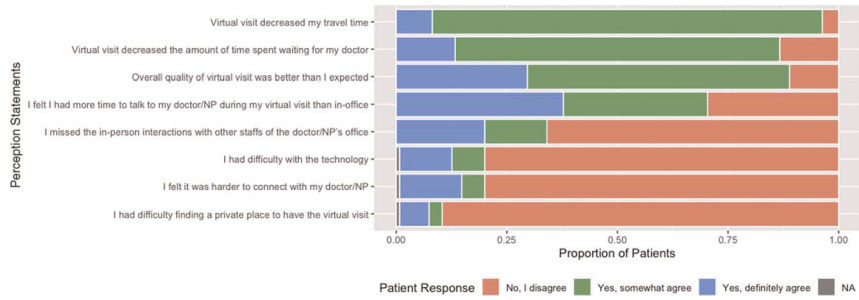

FIGURE 1. Patients' perceptions with synchronous telemedicine in urogynecology.

reported difficulty forming a personal connection with their health care providers.

Willingness to Participate in Future Telemedicine Visits

Twenty-one respondents (15.6%) were considered "neutral" on the willingness question and excluded because they were told that they needed to have an in-person evaluation after their telemedicine visit. One hundred fourteen responses were analyzed for willingness to participate in future telemedicine visits. Most participants (88.5%) reported that they would continue to receive urogynecology care through the telemedicine platform (Fig. 2). Participants' willingness to continue telemedicine care was high regardless of the age group, 65 years and older or younger than 65 years (87.5% and 90.0%, respectively; $P = 0.68$ (Table 2). Participants' willingness to continue telemedicine care was also high in both new consults (93.8%) and established follow-up visits (86.6%).

Regarding the device used for the virtual care, our participants preferred video technology over a telephone visit to continue their care in telemedicine (Fig. 2). However, the modality used for telemedicine did not show association to how they answered the willingness question (Table 2). Of the women who indicated a willingness to continue their care with telemedicine, 58.4% reported no preference for either a telephone or a video visit, whereas 27.7% and 13.9% of respondents showed a preference for video and telephone, respectively (Fig. 2). Although 19.4% of all respondents reported that they had difficulty with technology, there was no association between difficulty with technology and willingness to continue with telemedicine among those who were included in the analysis for the willingness (Table 3).

When the willingness answer was analyzed in the context of their perceptions of their telemedicine experience, it showed that those who found that the quality of telemedicine exceeded their expectation were willing to participate in a future telemedicine visit than those who did not ($P = 0.019$). Similarly, those who agreed that telemedicine decreased the waiting time or that more time was spent talking with the provider than in-office also were more accepting of the future telemedicine visits in FPMRS ($P = 0.041$ and $P = 0.051$, respectively) (Table 3). No other perceptions of telemedicine were significantly associated with the willingness to continue telemedicine.

New Patient Consults and Follow-up Physical Examination Findings

Of the participants who presented for a new consult telemedicine visit, 34.0% had the visit diagnosis of pelvic organ prolapse. With the easing of social distancing restrictions, 11 of the 13 consult patients with pelvic organ prolapse had an in-person follow-up visit where all except 1 participant was found to have stage II or greater pelvic organ prolapse. When Pelvic Organ Prolapse Distress Inventory 6 reports of these patients

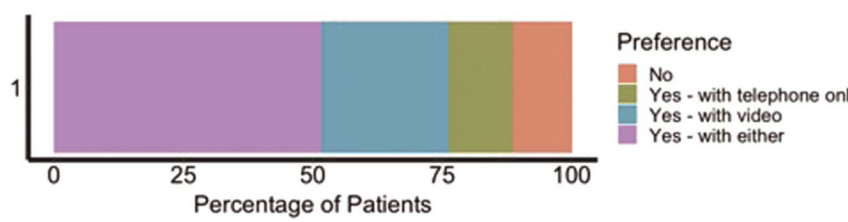

FIGURE 2. Patient willingness to accept telemedicine care in urogynecology.

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TABLE 2. Willingness to Engage in Telemedicine by the Respondent Characteristics

Variable	Willing, n = 101	Not Willing, n = 13	P*
Age, y†	62.0 (16.5)	65.5 (19.5)	0.54
65 or greater	56 (87.5)	8 (12.5)	0.68
<65	45 (90.0)	5 (10.0)	
Encounter type			0.28
Consult	30 (93.7)	2 (6.3)	
Established follow-up	71 (86.6)	11 (13.4)	
Mode of telemedicine			0.55
Video visit	63 (90.0)	7 (10.0)	
Telephone technology	38 (86.4)	6 (13.6)	
Prior exposure to telemedicine			1.00
Yes	46 (88.5)	6 (11.5)	
No	55 (88.7)	7 (11.3)	
Distances to the main hospital‡	14.1 (7.4–29.3)	8.1 (3.0–11.3)	0.02*
Charlson Comorbidity Score†	2.81 (2.3)	3.54 (2.5)	0.34

Data reported in as number (percentage) unless indicated otherwise.
*$P < 0.05$.
†Mean (SD).
‡Median (IQR).

were reviewed, all reported symptoms of feeling a bulge "somewhat" to "quite a bit" of the time.[24] All subsequently underwent appropriate treatments within 6 months of their initial telemedicine visit. In addition, of the 5 participants who were given a telemedicine diagnosis of genitourinary syndrome of menopause, all had physical examination findings consistent with this diagnosis at their follow-up in-person examination visit.

DISCUSSION

Since the beginning of the social distancing order, our practice has rapidly adapted to using a synchronous telemedicine model for all nonemergent FPMRS ambulatory visits. During this period, most participants had a positive experience with telemedicine and were willing to continue their FPMRS telemedicine care after the pandemic. More specifically, the participants who were satisfied with the telemedicine visit's overall quality and decreased travel time were more likely to want to participate in telemedicine care in the future.

Unlike previous descriptive studies on synchronized telemedicine care in FPMRS, this study did not limit the participant pool to visit type or visit diagnoses.[15,16,22,23] Both established and new consult patients were included in the analysis, and both groups reported similarly positive perceptions of telemedicine care. This positive perception was also

TABLE 3. Patients' Perception of Telemedicine Visit

Agreed Perception Statements	Willing, n = 101	Not Willing, n = 13	P*
Positive perceptions			
Virtual visit decreased my travel time	98 (97.3)	11 (84.6)	0.10
The overall quality of the virtual visit was better than I expected	92 (91.1)	9 (69.2)	0.04*
Virtual visit decreased the amount of time spent waiting for my provider	90 (89.1)	8 (61.5)	0.02*
I felt I had more time to talk to my provider during my virtual visit than in-office	75 (74.3)	6 (46.2)	0.05
Negative perceptions			
I missed the in-person interactions with other staffs (nurses, schedulers/admins, medical assistants) of my provider's office	29 (28.7)	7 (53.9)	0.11
I felt it was harder to connect (form a relationship) with my provider	16 (15.8)	5 (38.5)	0.06
I had difficulty with the technology (ie, Internet connection, call quality, sound issues)	16 (15.8)	5 (38.5)	0.06
I had difficulty finding a private place to have the virtual visit	8 (7.9)	2 (15.4)	0.32

Data reported in as number (percentage) of respondents who agreed ("definitely agreed" and "agreed") with the given perception statement.

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similar among the participants regardless of their age, comorbidities, previous exposure to telemedicine, or the distance from our facility, further increasing the generalizability of telemedicine's application.

Before the COVID-19 pandemic, telemedicine was used to provide health care in resourceless and remote parts of the country by eliminating physicians or patients' need to travel for medical care. However, recent temporary suspensions on telemedicine restrictions allowed us to experience the merits of telemedicine and support those advocating for the expansion of the model beyond the pandemic period. Although it is important to note that a patient's distance from our clinic was positively associated with how they answered the willingness question, it is also notable for remarking that the perception with most agreement regardless of the distance from the clinic was that telemedicine decreases travel time. This finding aligns with previous studies that found telemedicine can reduce medical transportation-associated health care costs.[19,25]

The temporary expansion of telemedicine also relieved the licensure restrictions, allowing health care providers to see patients across state lines without being licensed by the state where the patient is located.[26,27] Therefore, we were able to provide not only continued care for our established patients, but we were also able to establish new patient relationships without patients having to travel to a metropolis location. This enhanced access to health care may dissipate health care disparities by increasing access to high-volume medical centers that are often in urban settings.[28]

Perhaps the most commonly hypothesized concern for using telemedicine care in the medical field with a large geriatric population such as in FPMRS is difficulty with technology.[4,20,29] Using data from the National Health and Aging Trends Study, Lam et al[20] estimated that 20% of older adults were unready for telemedicine care. This study cited that unreadiness was associated with men, poorer self-reported health, and residing in a nonmetropolitan area. Similarly, our study found that 19.4% of respondents reported having technical difficulties. Albeit anecdotal, the older patients (≥65 years) often needed more time connecting onto the video platform, which we hypothesized to have a negative impact on their perception of the visit. However, our results showed the contrary. Older age or difficulty connecting to telemedicine did not impact the acceptance of telemedicine. This finding may be secondary to selection bias because participants accepted telemedicine in lieu of delaying care. In addition, the nationwide advertisement of the telemedicine model during COVID-19, the transition of nonmedical public systems to virtual services, and increased availability for telemedicine infrastructures may have effectively lowered the psychological barrier of patients' unfamiliarity and improved the acceptance of this model. Despite our patient population, most respondents preferred videoconferencing over telephone visits even though the former required a smartphone or a personal computer and required additional steps to connect. This observation adds to the known benefit of video conferencing as it has been shown to provide greater diagnostic accuracy and fewer medication errors compared with the telephone-only model.[30]

This study further supports the feasibility of telemedicine use in urogynecology by demonstrating the reliability of pelvic organ prolapse subjective symptoms both on history and on the Pelvic Organ Prolapse Distress Inventory 6.[4] Although the staging of pelvic organ prolapse requires a pelvic examination, this study shows that we could provide an overview of treatment options for pelvic organ prolapse based on the patient's history alone. Within the field of FPMRS, the patient's ultimate treatment is based on shared decision-making and tailoring treatment to meet the patient's goals and expectations. Although we acknowledge the additional barrier of finding a private location, telemedicine visits allowed discussion of treatment options and gave patients more time to review these options before returning to the office for an examination. Future studies are needed to investigate patients' satisfaction with treatment and telemedicine care.

Despite many favorable findings, telemedicine's permanent utilization relies on either continuing pandemic-driven restrictions or the institutionalization of telemedicine-friendly policies. As such, it is pertinent to continue building further evidence with high-quality comparative studies that will support telemedicine use as an effective, efficient, and patient-centered model. In conjunction with this, standardization of telemedicine delivery policies should be carefully studied and developed to avoid any potential barriers to care and reduce health care disparity. Furthermore, establishing a validated method of educating the next generations of health care providers in best practices for telemedicine is essential to ensure that we continue to provide high-quality care across all modalities moving forward.

Unlike prior studies,[4,12,15,17,31,32] this study evaluated patients' perceptions of telehealth for a broad range of diagnoses commonly seen within a urogynecology office. However, our findings should be discussed along with several significant limitations. First,

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the inherent selection bias present within the survey study design should be recognized because the survey was only sent to the pool of patients whose alternative to telemedicine was to delay care until in-person visits became available. This study may have overestimated the willingness to participate because the patients unwilling to accept or who did not accept a virtual visit with us may be marginalized and lack the necessary resources to participate in telemedicine care. In addition, the study was in a metropolitan city in the New England area serving mostly a privately insured White patient population, which limited the generalizability to a more diverse U.S. population. Future studies should investigate whether the willingness to participate in telemedicine is as prevalent among those who are not proficient in English. Finally, survey analysis did not include longitudinal measures to see if participants' perceptions changed as social distancing orders continued or lifted restrictions. Telemedicine care was a novel approach to our practice with a brief time between its introduction and implementation. As such, participants' perceptions may have been affected as the new practice model's efficiency evolved over time.

In conclusion, this study demonstrated the acceptability of a telemedicine model within FPMRS. Regardless of the patient type, telemedicine modality, or visit diagnoses, telemedicine was well perceived. This study builds enthusiasm to develop further the research and clinical use of telemedicine for women with pelvic floor disorders.

ARTICLE INFORMATION

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