Background: The coronavirus disease 2019 (COVID-19) pandemic has led to a dramatic increase in virtual care (VC) across outpatient specialties, but little is known regarding provider acceptance of VC.

Objective: The objective of this study was to assess provider perceptions of the quality, efficiency, and challenges of VC versus in-person care with masks.

Design: This was a voluntary survey.

Participants: Mental health (MH), primary care, medical specialty, and surgical specialty providers across the 8 VA New England Healthcare System medical centers.

Measures: Provider ratings of: (1) quality and efficiency of VC (phone and video telehealth) compared with in-person care with masks; (2) challenges of VC; and (3) percentage of patients that providers are comfortable seeing via VC in the future.

Results: The sample included 998 respondents (49.8% MH, 20.6% primary care, 20.4% medical specialty, 9.1% surgical specialty; 61% response rate). Most providers rated VC as equivalent to or higher in quality and efficiency compared with in-person care with masks. Quality ratings were significantly higher for video versus phone ($\chi^2 = 61.4, P < 0.0001$), but efficiency ratings did not differ significantly. Ratings varied across specialties (highest in MH, lowest in SS; all $\chi^2 > 24.1, Ps < 0.001$). Inability to conduct a physical examination and patient technical difficulties were significant challenges. MH providers were comfortable seeing a larger proportion of patients virtually compared with the other specialties (all $\chi^2$s > 12.2, $Ps < 0.01$).

Conclusions: Broad provider support for VC was stratified across specialties, with the highest ratings in MH and lowest ratings in SS. Findings will inform the improvement of VC processes and the planning of health care delivery during the COVID-19 pandemic and beyond.

Key Words: virtual care, telehealth, telemedicine, COVID-19

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physical examination, VC might more closely approximate
in-person care as compared with medical (MS) and surgical
specialties (SS). Furthermore, video sessions could provide
an added benefit of improving communication and inter-
pretation of facial expressions without the hindrance of
masks. However, for non-MH providers, the perceived ad-
vantages of conducting an in-person physical examination
may at times outweigh the benefits of virtual visits. Recent
qualitative work found that primary care (PC) providers often
doubted their ability to conduct adequate virtual physical
examinations\textsuperscript{10}, such concerns might be more pronounced
among MS and SS providers.

Despite the safety, convenience, and fiscal advantages of
VC, technical issues can pose significant challenges. Video
appointments require that patients and providers own the
necessary equipment, feel comfortable navigating technology,
and have the required bandwidth for video streaming\textsuperscript{5,10,11}
Even if these requirements are met, poor audio and video
connectivity can significantly degrade the quality of video
visits. Barriers may be particularly pronounced in rural areas,
where broadband access is poorer and residents are less likely
to own a smartphone, tablet, or home computer as compared
with suburban or urban-dwelling Americans\textsuperscript{12,13} As such,
ease of use and familiarity for providers and patients may
make phone visits preferable to video visits\textsuperscript{14,15} The relative
advantages and challenges of in-person, video, and phone
visits may also vary as a function of specialty and context,
such as treating new versus established patients. These vari-
ables have not been examined across specialties and are
critical in understanding providers’ overall perceptions of VC
during the COVID-19 pandemic.

To better understand how to sustain VC during the re-
opening of outpatient clinics, we sought to learn how MH, PC,
and MS and SS providers perceived the quality, efficiency, and
challenges of phone and video telehealth visits following the
onset of the COVID-19 pandemic as well as their comfort
providing VC to their patients in the coming months. Here we
report the results of a survey of attitudes towards VC completed
by nearly 1000 providers from the Department of Veterans
Affairs (VA), the largest health care system in the United States.

METHODS

Study Sample

A voluntary and anonymous electronic survey was dis-
tributed to MH, PC, MS, and SS providers (physicians, psy-
chologists, social workers, nurse practitioners, pharmacists,
physician assistants, and podiatrists; see Supplemental Digital
Content 1 for full sample definitions, http://links.lww.com/
MLR/C240) across 8 medical centers comprising the VA New
England Healthcare System, a 6-state regional health care sys-

tem serving ~260,000 Veterans annually. Four medical centers
are in urban or suburban locations and 4 are rural (see Sup-
plemental Digital Content 2 for included medical centers, http://
links.lww.com/MLR/C241).

Questionnaire Design and Data Collection

The shift to VC occurred during the week of March 16,
2020, with the rapid cessation of all nonurgent outpatient
visits. A survey link was distributed by medical center chiefs
of staff through clinical service chiefs to providers; the first
invitation was sent on May 18, with frequent email reminders
until the close of the survey on June 12, 2020. Multiple
choice questions assessed provider perceptions of VC (phone
and video telehealth) during the past month (ie, 2–3 mo after
the shift to VC). Questions assessed experience with VC,
perceptions of the quality and efficiency of care, challenges of
using VC, and comfort seeing patients virtually in the coming
months. The first author developed an initial draft of survey
questions that was informed by prior research and reviews of
the literature examining provider attitudes towards telehealth\textsuperscript{5–8} Questions were edited and refined via an iter-
ative process involving input from all co-authors. Responsive-
driven branch logic was used with a maximum of 30 ques-
tions per respondent and an average completion time of
~7 minutes (see Supplemental Digital Content 3 for full
survey, http://links.lww.com/MLR/C242).

Data Synthesis and Analysis

Descriptive statistics, \(\chi^2\) tests, and Student \(t\) tests were
conducted using IBM SPSS Statistics for Windows, Version
26.0 (IBM Corp., Armonk, NY). Data collection plans were
reviewed by the VA Boston Research and Development
Committee; the project was classified as quality improvement
and was therefore exempt from IRB review.

RESULTS

During the month covered by this survey, the VA New
England Healthcare System recorded 293,351 outpatient visits
(as obtained from administrative datasets), representing an 11% reduction from the same month 1 year prior (329,632). A
60.6% decrease in in-person visits (from 250,693 to 98,854)
was largely replaced by a 146.4% increase in VC visits
[110.1% increase in phone (from 77,863 to 163,600), 2771.5%
increase in video (from 1076 to 30,897)]. The transition from
in-person to VC was accomplished over ~1 week’s time. This
rapid change was facilitated by the implementation of a tele-
health infrastructure well before the onset of COVID-19\textsuperscript{2}.

There were 1028 survey respondents across the in-
cluded specialties (61% approximate response rate; see Sup-
plemental Digital Content 4 for calculations, http://links.lww.
com/MLR/C243). Thirty reported no VC appointments in
the past month and were excluded from subsequent analyses,
resulting in a final sample of 998 providers (49.8% MH,
20.6% PC, 20.4% MS, 9.1% SS; Occupations: 43.6%
 physicians, 22.1% psychologists, 13.4% social workers,
12.0% nurse practitioners, 3.9% pharmacists, 3.3% physician
assistants, 1.6% podiatrists; 28.9% rural, see Table 1 for
additional characteristics). During the month before being
surveyed, 98.5% of providers reported having conducted a
phone appointment and 80.6% reported having conducted a
video telehealth appointment. MH and PC providers had
significantly higher rates of video experience (87.5% and
89.3%, respectively) compared with MS and SS providers
(58.8% and 71.4%, \(\chi^2 = 91.9, P < 0.001\), Table 2).

Among providers with VC experience, the majority
rated video and phone visits as equivalent to or higher in
quality and efficiency than in-person care with masks (Video
quality endorsement = 75.8% of providers, efficiency = 79.9%; phone quality endorsement = 62.8% of providers, efficiency = 79.7%. These quality ratings were significantly higher for video than for phone ($\chi^2 = 61.4$, $P < 0.0001$), but efficiency ratings were not significantly different ($\chi^2 = 1.4$, $P > 0.05$). Phone and video quality and efficiency ratings were significantly different across specialties with MH having the highest and SS having the lowest ratings (all $\chi^2$s > 24.1, $P < 0.001$, Figs. 1A, B). Among providers with both phone and video experience ($n = 789$), 56.5% reported generally preferring video visits over phone visits (35.9% preferred phone, 7.6% “other,” with common write-in responses being no preference or patient’s preference, Table 2). MH providers were more likely to prefer video visits compared with the other specialties ($\chi^2 = 60.23$, $P < 0.001$), and a greater percentage of PC and SS providers preferred phone visits over video visits.

Inability to conduct a physical examination was the most frequently identified challenge of conducting phone appointments (34.2% endorsement), particularly among PC, MS, and SS providers. Additional challenges of phone visits included receiving full workload credit (24.7%) and inability to assess physical health status (17%, Table 3). For video visits, frequent challenges included patient difficulty using their device and/or telehealth platform (30.1% endorsement), lack of technical support and training for patients (24.7%), and inadequate patient internet access (23.6%). PC, MS, and SS providers were more likely to endorse patient technical challenges (difficulty using their device and lack of technical support) as compared with MH providers (all $\chi^2$s > 12.4, $P < 0.001$).

### Table 1. Characteristics of Survey Respondents

| Characteristics        | Overall Respondents (Total $N = 998$) (%) | Respondents in Specialty (%) |
|------------------------|------------------------------------------|-------------------------------|
| Mental health ($n = 497$) | 49.8                                     | 44.5                          |
| Psychologist           |                                          | 27.0                          |
| Social worker          |                                          | 20.5                          |
| Physician              |                                          | 6.4                           |
| Nurse practitioner      |                                          | 1.2                           |
| Pharmacist             |                                          | 0.4                           |
| Primary care ($n = 206$) |                                          | 20.6                          |
| Physician              |                                          | 62.6                          |
| Nurse practitioner      |                                          | 18.9                          |
| Pharmacist             |                                          | 12.6                          |
| Physician assistant    |                                          | 5.8                           |
| Medical specialties ($n = 204$) |                                          | 20.4                          |
| Physician              |                                          | 75.0                          |
| Nurse practitioner      |                                          | 19.1                          |
| Pharmacist             |                                          | 3.4                           |
| Physician assistant    |                                          | 2.5                           |
| Surgical specialties ($n = 91$) |                                          | 9.1                           |
| Physician              |                                          | 56.0                          |
| Podiatrist             |                                          | 17.6                          |
| Physician assistant    |                                          | 15.4                          |
| Nurse practitioner      |                                          | 11.0                          |

See Supplemental Digital Content 1 for specialty definitions (http://links.lww.com/MLR/C240).

### Table 2. Provider Virtual Care Experience and Preferences

| Characteristics           | Overall | MH  | PC  | MS  | SS  |
|---------------------------|---------|-----|-----|-----|-----|
| Phone experience in past month | 98.5    | 97.4| 100 | 99.5| 98.9|
| Video experience in past month | 80.6    | 87.5| 89.3| 58.8| 71.4|
| Virtual care preference*  |         |     |     |     |     |
| Video over phone          | 56.5    | 67.1| 42.8| 46.2| 44.1|
| Phone over video          | 35.9    | 23.8| 53.6| 43.3| 52.5|
| Other (eg, no preference, defer to patient’s preference) | 7.6    | 9.1 | 3.6 | 10.6| 3.4 |

*Only includes providers with both video and phone experience. MH, $n = 386$; PC, $n = 166$; MS, $n = 104$; SS, $n = 59$.

MH indicates mental health; MS, medical specialty; PC, primary care; SS, surgical specialty.
TABLE 3. Provider Endorsement of Virtual Care Challenges

| Virtual Care Challenges                                                                 | Percent of Providers Endorsing as a Significant Challenge |
|----------------------------------------------------------------------------------------|----------------------------------------------------------|
|                                                                                       | Overall | MH | PC | MS | SS |
| Inability to conduct a physical examination to the degree required                     | 34.2*** | 10 | 37.5 | 42.9 | 59.1 |
| Receiving full workload credit for appointments                                         | 24.7*   | 24 | 12.5 | 34.3 | 4.5 |
| Assessing physical health status                                                       | 17      | 11.8 | 18.8 | 15.7 | 31.8 |
| Poor communication/support from leadership                                             | 8.2     | 2  | 12.5 | 10  | 13.6 |
| Establishing rapport with the patient                                                  | 3.1     | 0  | 6.3  | 4.3  | 4.5  |
| Patient hearing provider adequately                                                    | 1.9     | 2  | 0    | 2.9  | 0    |
| Hearing the patient adequately                                                        | 1.2     | 2  | 0    | 0    | 4.2  |
| Ensuring patient’s safety and confidentiality                                          | 0       | 0  | 0    | 0    | 0    |

**Video telehealth challenges (N = 753)**

| Patient having difficulty using their device and/or video telehealth platform         | 30.1**  | 24.9 | 33.5 | 40.2 | 37.3 |
| Lack of technical support/training for patients                                      | 8.4*    | 6.1  | 8.9  | 8.7  | 5.1  |
| Patient hearing provider adequately                                                  | 7.4     | 3.4  | 7.8  | 6.3  | 3.3  |
| Patient having access to adequate internet connection                                | 17.6*** | 2.5  | 29.9 | 41.2 | 55.9 |
| Scheduling procedures                                                                 | 14.7    | 11.6 | 19.6 | 17.5 | 16.9 |
| Assessing physical health status                                                      | 8.6***  | 3.8  | 15.6 | 14.7 | 10.2 |
| Lack of technical support/training for providers                                      | 8.4*    | 6.1  | 12.6 | 11.7 | 6.8  |
| Patient seeing provider adequately                                                    | 7.4     | 5.3  | 7.8  | 4.9  | 6.9  |
| Receiving full workload credit for appointments                                        | 6.7     | 6.4  | 8.4  | 4.9  | 6.9  |
| Provider having access to adequate internet connection                                | 6.5     | 5   | 9    | 4.9  | 11.9 |
| Poor communication/support from leadership                                             | 5.9     | 4.5  | 6    | 10.7 | 6.8  |
| Provider difficulty using device and/or video telehealth platform                     | 5.7     | 5.1  | 6.5  | 2.9  | 11.9 |
| Patient seeing provider adequately                                                    | 5.4     | 5.8  | 7.2  | 2    | 3.4  |
| Hearing the patient adequately                                                        | 4.4     | 5.3  | 4.1  | 2    | 3.3  |
| Inappropriate or distracting patient behavior                                          | 4.3**   | 6.8  | 0.6  | 1    | 3.4  |
| Establishing rapport with the patient                                                 | 2.1     | 1.5  | 2.4  | 2    | 5.1  |
| Ensuring patient’s safety and confidentiality                                          | 1.4     | 2    | 0.6  | 1    | 0    |

†To reduce respondent burden, phone challenge items were only asked of respondents who reported conducting no video appointments in the past month. Video challenge items were asked of providers with video experience.

MH indicates mental health; MS, medical specialty; PC, primary care; SS, surgical specialty.

Asterisks denote significance (MH, PC, MS, SS) differences in percent reported as a significant challenge via χ² tests:

*P < 0.05.

**P < 0.01.

***P < 0.001.

Ps < 0.01). Inability to conduct a physical examination was again reported as a challenge for PC, MS, and SS providers (> 29.9% endorsement). The overwhelming majority (> 96%) of providers did not encounter significant difficulties establishing rapport or ensuring patient safety and confidentiality during phone or video appointments. Providers reported experiencing a technical issue during 11.4% of their phone appointments and 35.2% of their video appointments on average during the prior month. There were no differences in endorsement of technical challenges or frequency of technical issues between providers at rural versus urban sites (all $\chi^2$'s < 3.00, $t$ = 1.73, Ps > 0.05).

The majority of providers with phone experience (57.5%) were comfortable seeing most established patients via phone in the coming months, but fewer (34.5%) were comfortable seeing most new patients via phone. The majority of providers with video experience (67.4%) were comfortable seeing most of their established patients via video, but MH providers were the only group in which the majority (74.8%) felt comfortable seeing most of their new patients via video. Overall, MH providers were comfortable seeing a larger proportion of patients virtually compared with the other specialties (all $\chi^2$'s > 12.2, Ps < 0.01, Figs. 2A, B).

DISCUSSION

VA providers across a range of specialties conveyed broad overall support for VC during the COVID-19 pandemic. Most providers rated the quality and efficiency of care delivered via phone and video telehealth as equivalent to or higher than in-person care with masks. Importantly, establishing rapport with patients via VC did not emerge as a challenge, and providers reported feeling comfortable delivering a considerable portion of their care virtually in the months following survey completion.

Significant differences were observed across specialties. MH providers consistently demonstrated more positive perceptions of VC than PC, MS, and SS providers. Abundant literature supports the effectiveness and overall acceptance of virtual MH care, which does not require an in-person physical examination. Furthermore, during COVID-19, video appointments circumvent the barriers that masks impose on patients and providers in communicating and interpreting facial expressions, which are core components of effective MH care. In contrast, 30% to 60% of PC, MS, and SS providers viewed the inability to conduct a physical examination as a significant drawback of VC. In keeping with this finding, a minority of PC, MS, and SS providers were comfortable...
seeing at least half of their new patients virtually in the coming months, although numbers increased when considering established patients. These findings highlight significant specialty-specific differences in the perceived quality of care that can be provided virtually and emphasize the need for innovation and training in virtual physical examination, including enhanced use of technology to assess health status remotely.18,19

Consistent with prior work, patient difficulties navigating video telehealth technology were viewed as a significant challenge across specialties.5,6,11 Simplification of patient-facing technology and intensified patient education and technical support in the use of video telehealth will be critical to improve VC experiences. Surprisingly, endorsement of technical challenges did not differ between providers working at rural versus urban sites, which conflicts with well-established findings of poorer broadband connectivity and access to video-enabled devices among rural populations.12,13 It is possible that a more granular measure of patient rurality would have revealed significant differences within our sample; for example, the catchment areas of some providers

working at urban sites might have included a significant number of rural patients. It will also be important to assess this question from the patient perspective to determine whether there are differences in barriers reported by patients in urban versus rural settings.20 It is worth noting that rurality findings may differ in non-VA populations. The VA was able to expand the use of telehealth across all facilities regardless of location well before the pandemic;2 contrast, Medicare and the private sector only reimbursed telehealth services for patients residing in rural locations before COVID-19.21

Providers reported more technical difficulties during video appointments versus phone appointments, and a greater percentage of PC and SS providers preferred phone visits as compared with video. PC, MS, and SS providers were more likely to endorse patient technical challenges during video appointments as compared with MH providers, indicating that increased support may be needed to improve perceptions and utilization among these specialties. Indeed, reports of medical providers defaulting to phone visits over video because of ease of use are increasingly common during COVID-19.14,15 Findings suggest that the effort required to overcome the technological hurdles of video visits may seem more worthwhile in certain clinical scenarios or for certain specialties. It is important to note that video visits may indeed have clinical advantages over phone appointments: the increased information provided via video has been shown to improve provider diagnostic accuracy and decision-making and reduce medication errors as compared with phone visits.22 This finding underscores the need to improve telehealth technologies, streamline video integration into clinical workflows, and prioritize provider education to increase uptake. Furthermore, phone visits have historically been reimbursed at lower rates than video or in-person care,22 and receiving full workload credit was described as a significant challenge of phone appointments in the current survey. Although phone visit reimbursement has since increased due to COVID-19 billing expansions,23,24 these changes may not be permanent, further emphasizing the need to increase acceptability of video visits as an alternative.25

Despite the endorsement of VC challenges, most providers across specialties reported that phone and video care were as efficient or more efficient than in-person care with masks. VC eliminates the need to don and doff personal protective equipment or disinfect examination rooms between patients, and patients may be more punctual without having to negotiate traffic and parking. In addition, a recent meta-analysis found that MH visits conducted by phone are significantly shorter than in-person appointments, suggesting that VC modalities may lend themselves to more efficient patient interactions.26 Similar provider reports of increased efficiency have been observed within PC.27,28

Rates of video experience were significantly lower among MS and SS providers as compared with MH and PC providers. This is consistent with VA having implemented national goals to increase MH and PC video use before COVID-19,2 as well as reports of very low pre-COVID use of telehealth within private sector specialty care due to reimbursement barriers.29 Both public and private sector health care systems will need to adjust incentives to sustain high
rates of VC. Given that provider attitudes towards VC have been found to improve with experience, it will be important to track potential changes in provider perceptions across specialties as their VC utilization increases.

Limitations of this work include its restriction to a regional sample of VA providers. As with all voluntary surveys, there is a possibility of response bias in that the providers who chose to complete the survey may differ from those who opted out. The disproportionate representation of MH providers (49.8%) may have introduced an additional bias, although the sample size was sufficiently large to reveal the perspectives of non-MH providers. As detailed in Supplemental Digital Content 4 (http://links.lww.com/MLR/C243), our sampling methodology prevented us from calculating an exact survey response rate, as the total number of eligible providers reached by the survey invitation is unknown; therefore we approximated the response rate based on the number of active VA providers at the time of survey administration. The survey questions assessing providers’ perceptions of quality and efficiency of care have not been validated, and definitions of quality and efficiency were not included within these items, raising the possibility that different providers interpreted the meanings of quality and efficiency of care differently.

The survey also did not assess whether providers had telehealth experience before the onset of COVID-19; this could have impacted attitudes, given findings that providers’ opinions of telehealth tend to improve with experience. VA had encouraged use of telehealth before the pandemic, particularly within MH and PC; indeed, working at a VA was found to be one of the most significant predictors of having pre-COVID telehealth experience within a national sample of psychologists. However, despite having higher rates of telehealth use than the private sector, rates of pre-COVID telehealth usage within VA were still relatively low (eg, than the private sector, rates of pre-COVID telehealth use were still relatively low (eg, ∼9% of all MH appointments), in part due to provider and patient hesitance and difficulties integrating telehealth appointments into workflows (eg, scheduling procedures). This suggests that previous provider experience likely does not significantly bias the current findings.

Qualitative data is needed to better understand specialty-level differences in provider perceptions of VC; important work in this area has already been initiated during COVID-19 by other research groups. There is also a need to examine differences in provider perceptions based on provider type (eg, psychologists, physicians, nurse practitioners). Attitudes may vary based on factors such as caseload size, appointment length, nature of clinical care, and the frequency that providers see their patients; we plan to explore potential provider type differences within the current survey in forthcoming secondary analyses. Patient perspectives were not captured in this survey and will be critical to examine. Prior work reports high patient satisfaction with VC and suggests that patients may have more positive perceptions of VC than providers, particularly due to the convenience of not having to travel to an appointment; concerns about exposure to SARS-CoV-2 will likely only increase these positive views of VC. Health care systems must also address disparities in access to video-enabled devices, particularly among older, rural, and low-income patients, to ensure equitable access to VC.

Indeed, work within VA has demonstrated the positive effects of distributing tablets to patients without access to a device. Finally, further research assessing clinical processes and outcomes is necessary to assess the true efficacy of VC.

To our knowledge, this is the first reported survey that compares provider attitudes towards VC across a wide range of specialties during the COVID-19 pandemic. Providers demonstrated both broad overall support for VC as well as striking specialty-specific differences in the perceived need for in-person patient visits. Our findings emphasize the need for improvements in VC technology and connectivity, increased patient and provider training, and more streamlined integration of video telehealth into clinical workflows to sustain high levels of VC across specialties during the COVID-19 pandemic and beyond.

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