

RESEARCH ARTICLE

Convenience is Key for Patient Engagement with Remote Video Visits in a Musculoskeletal Practice

Harrison Miner, BA¹; David Ring, MD, PhD¹; Karl M. Koenig, MD, MS¹

Research performed at Dell Medical School at The University of Texas at Austin, Austin, TX, USA

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Abstract

Background: Remote video visits (aka telemedicine, virtual care) have the potential to increase access to orthopaedic specialty evaluation while decreasing the overall cost of care. Clinical implementation of remote video visits may benefit from an understanding of potential barriers to participation.

Methods: We enrolled one hundred and thirty participants from a university-based musculoskeletal clinic with a large uninsured population. We asked participants to complete a survey, including demographics and scaled perception questions about remote video visits. Data from these surveys were analyzed with multivariable logistic regression to determine factors associated with willingness to participate in video visits, as well as the situations in which patients would consider a video visit.

Results: Willingness to participate in video visits was associated with the perception of video visits being more convenient (OR 3.0) and a decreased perceived importance of physical exam (OR 0.36) but not age, technology comfort, or travel distance to the clinic. Additionally, those with prior video visit experience were more comfortable with technology, perceived video visits to be more convenient, and were more willing to have another video visit. Fifteen percent were willing to have a video visit for their first visit, while 78% would participate for a routine non-surgical follow-up.

Conclusion: Musculoskeletal telemedicine programs can become established by focusing on people that prioritize convenience, place less importance on a hands-on exam, and are established patients.

Level of evidence: II

Keywords: Musculoskeletal care, Telemedicine, Virtual, Willingness

Introduction

Rural patients and those living in low-income parts of the city may face long or taxing (e.g., several busses) travel to get to a specialist. For rural patients, merely finding a specialist is challenging, as of 2010, there were 263 specialists per 100,000 population in urban counties while only 30 specialists per 100,000 in the most rural counties (1). Nevertheless, this increased density of specialists does not guarantee access for urban residents. Low-income patients face challenges such as unavailable or unaffordable childcare, difficult public transportation,

inconvenient clinic hours, and work insecurity, which often lead to inappropriate use of the emergency departments for care that could otherwise be performed in an office setting (2). Remote video visits leverage the power of our telecommunication technologies to provide synchronous care to patients while simultaneously removing many of the barriers to in-person visits. Aware of these advantages, companies like Amazon (Seattle, WA, USA) and Walmart (Bentonville, AR, USA) have begun to offer video visits to their employees as an

Corresponding Author: Karl M. Koenig, Department of Surgery and Perioperative Care, Dell Medical School, University of Texas at Austin, Austin, TX, USA
Email: karl.koenig@austin.utexas.edu



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additional benefit (3, 4). Policymakers and payers alike have also created initiatives to increase the use of video visits. With outbreak of COVID 19, changes in federal law have made video visits more accessible for Medicare patients through the removal of requirements that an in-person visit must occur before a virtual encounter and the removal of stipulations that patients must be located in a rural area. Commercial payers have followed suit by offering zero-dollar copays for telehealth visits. Though these regulatory changes are in response to an unprecedented public health emergency, it is feasible that many will continue after the crisis.

In 2015, a group in Rochester, New York, expanded access to primary care through the use of remote video visits. Based on post-visit surveys of this pilot program, 93% of patients reported that the video visit was an alternative to an after-hours clinic, and 86% reported that it was an alternative to the emergency room (5). The survey reported time savings of six or more hours, and reduced time off work by three to four hours. Respondents reported that a video visit was more convenient, decreased their travel time, and provided a quick assessment of their concerns.

In addition to increased access, studies have demonstrated video visits to be comparable to in-person encounters for the provider's ability to determine the correct diagnosis and make decisions regarding imaging studies or lab tests (6-8). In 2014, a cohort study used a video conferencing system to evaluate 34 patients after total joint arthroplasty in addition to their routine in-person visits and compared their experience to a group of 44 patients who only participated in routine in-person visits. Results showed fewer unscheduled visits, fewer phone calls, and better satisfaction in the video call group than in those that only had in-person visits (9). Nevertheless, there is little utilization of this technology amongst surgical specialists and their patients. Though 96% of orthopaedists' believe that video visits can aid in care, only 11% endorse using any virtual care modality (10, 11). Challenges in scheduling, concerns over reimbursement and apprehension over patient engagement, top the list of barriers to using video visits.

One concern that may limit the adoption of remote video visits for musculoskeletal care is that patients and clinicians might expect that an adequate physical examination must be done in person. In a prior qualitative study, patients who had participated in a video visit for primary care preferred an in-person encounter if they thought a physical exam might affect decision making (12). Traditional "hands-on" specialists, such as orthopaedic surgeons, may fear that patients will doubt the validity of medical advice given without an in-person exam. Orthopaedic surgeons surveyed about obstacles to remote video visits listed a lack of physical contact with patients and unsatisfactory patient relationships as the most significant limitations (13). This study aimed to address such concerns through a direct patient survey. We characterized patient perceptions of the use of video visits in the setting of a musculoskeletal clinic to yield insights into the willingness of patients to participate. Finally, we identified the characteristics of patients who

are more likely to utilize a video visit platform.

The present study poses three questions: 1. what is the impact of a patient's perception of remote video visits on willingness to participate in video visits? 2. What demographic characteristics (i.e. age, gender, race, distance from clinic, difficulty with travel, device ownership, prior knowledge, and prior experience with remote video visits) are associated with willingness to participate in video visits? 3. For what encounter types are patients willing to use remote video visits?

Materials and Methods

Study Design

Participants were recruited for this prospective cross-sectional survey from new and return patients visiting a university-based musculoskeletal specialty clinic, including an Arthroplasty, Orthopaedic Sports Medicine, and a back and neck pain clinic. All English-speaking individuals 18 years and older were eligible for inclusion in the study from October to December 2019. We invited patients meeting the inclusion criteria to participate. Patients who had previously been enrolled were excluded. The Institutional Review Board approved this project.

Participants were first provided with a description of remote video visits and then given a survey with questions about demographics (age, race, gender, home zip code), ownership of a device capable of making a video call, prior experience with video visits, and difficulty with travel to the clinic. The survey also contained six statements about video visits asking them to state their level of agreement/disagreement using the Likert scale (strongly agree, agree, neutral, disagree, strongly disagree). Neutral participants and those who agreed or strongly agreed with the statement "I would be willing to receive some of my musculoskeletal care through video visits" were then allowed to select which situations they would be willing to utilize video visits. Surveys were delivered on an iPad or administered orally if the participant preferred. All survey questions required an answer, so there was no missing data.

Study Population

The 130 subjects included 73 (56%) women and 57 (44%) men with a median age of 49 with an interquartile range [IQR] 38-59 years [Table 1]. Ninety percent of our survey population endorsed having a device capable of making a video call. Sixty-three percent had prior knowledge of video visits, and 14% had participated in one before. 75% of our study population would be willing to have a virtual visit, while 25% would not. Our study population was slightly older than the US population and similar in its racial diversity with 62% identifying as Non-Hispanic Caucasian (vs. 60% in the US population), 21% identify as Hispanic (18%), and 11% as black (12%), and lived a median distance of 7.6 miles away from the clinic (14).

Statistical analysis

An a priori power calculation determined that a sample size of 130 patients was needed to answer our primary study question with 80% statistical power (with alpha =

Table 1. Patient characteristics

Variables	N = 130
Age in years	49 (38-59)
Gender	
Men	57 (44)
Women	73 (56)
Race/Ethnicity	
White	81 (62)
Non-White	49 (38)
Distance from Clinic in miles	7.6 (3.7-13)
Device Ownership	117 (90)
Prior Knowledge	82 (63)
Prior Experience	19 (14)
Willingness to Participate in Video Visits	98 (75)

Continuous variables as median (interquartile range); discrete variables as number (percentage).

0.05) to detect an OR of 1.75 for the correlation of factors associated with willingness to participate in video visits. Histograms and Shapiro-Wilk tests of normality showed non-normal distributions of the age and distance data. All demographic survey data, other than age and distance, were categorized as dichotomous for analysis. Distance from the clinic was estimated by the distance between the participants 5-digit zip code and the address of the clinic. Participants were considered willing to participate in video visits if they agreed or strongly agreed with the statement, "I would be willing to receive some of my musculoskeletal care through video visits." We treated all Likert scale data as ordinal with values of -2 to 2 (strongly disagree to strongly agree), with a higher score indicating the respondent is more receptive to video visits and a zero indicating a neutral response. We used Chi-squared tests for the relationships between dichotomous variables and Mann-Whitney U tests for differences between ordinal and dichotomous data as well as between non-normal interval and dichotomous data. A multivariable logistic regression model was used to adjust for potential confounders (prior experience, race, etc.) and to identify salient factors associated with willingness to participate in a remote video orthopaedic visit. We included all factors with $P < 0.10$ in bivariate analysis in the multivariable model [Table 2]. Results reported as odds ratios with 95% confidence intervals and two-sided p-values less than 0.05 were considered significant. We checked for multicollinearity using a correlation matrix of coefficients of the logistic model, considering all correlations of >0.50 to be collinear. We found none of the included variables to meet this threshold and therefore did not exclude any variables from the model due to collinearity. All statistical analysis was performed using Stata v. 15 (College Station, TX, USA).

Table 2. Multivariable Logistic Regression Model of factors associated with willingness to participate in a virtual visit

Variables	Odds Ratio	95% Confidence Interval	P value
Prior Knowledge	1.6	0.45-6.0	0.45
Prior Experience	3.1	0.23-42	0.40
Race (White)	2.6	0.70-9.4	0.152
Ownership of device capable of making a video call	2.2	0.28-16	0.46
Difficulty with Travel	1.8	0.90-3.6	0.10
Comfort with Technology	1.9	0.80-4.3	0.14
Provider understanding in virtual visit	1.7	0.79-3.8	0.17
Quality of care in virtual visit	2.1	0.98-4.72	0.056
Importance of physical exam	0.36	0.13-1.0	0.049
Convenience of a virtual visit	3.0	1.4-6.6	0.005

Bold indicates statistically significant difference.

Results

Impact of perception on willingness to participate in video visits

The multivariable analysis demonstrated that participants who thought of video visits as more convenient than in-person visits were more likely to participate in video visits (odds ratio [OR] 3.0, 95% confidence interval [CI] 1.4-6.6). Those that thought a hands-on exam was important were less likely to participate in remote video visits (OR 0.36, 95% CI 0.13-1.0) [Table 2]. Although 46% of people in our study strongly agreed with the statement, "I feel comfortable with using technology," only 27% strongly agreed that a video visit is more convenient than an in-person visit. Additionally, Age and distance from the clinic were not significant predictors of willingness to participate in video visits.

Association between prior experience and perceptions of video visits

There were notable differences between those with previous video visit experience and those without on bivariate analysis [Figure 1]. Those with prior experience were more comfortable with technology, perceived video visits to be more convenient and were more willing to have another video visit ($p=0.030$, 0.011, and 0.044 respectively) [Figure 1].

Encounter type and willingness to use remote video visits

Seventy-eight percent of participants were neutral or agreed with the statement, "I would be willing to receive some of my musculoskeletal care through video visits" and were allowed to select the situations in which they would be willing to utilize video visits. These results, showed that participants had specific preferences for

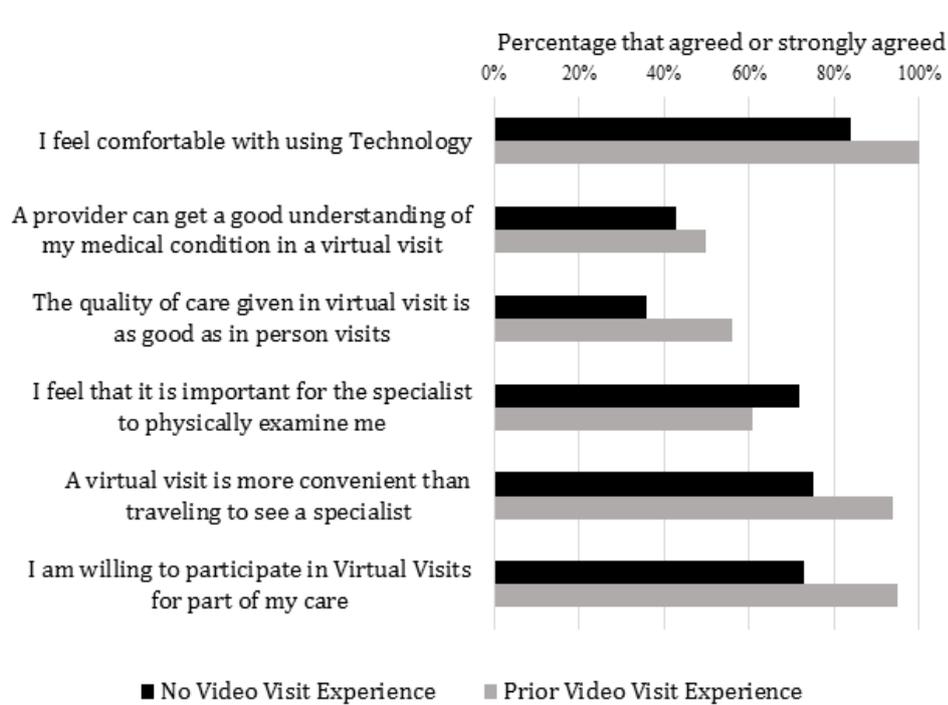


Figure 1. Graph demonstrating patient perception of remote video visits based on prior experience with video visits. Asterix indicates a statistically significant difference on bivariate analysis.

the types of encounters they would be willing to have via video visit [Table 3]. Seventy-eight percent indicated their willingness to participate for routine, non-surgical follow-ups, while 15% indicated that they would be willing to have their first visit with a clinician done over a video call. We also found that patients have specific preferences on how to schedule video visits. We presented survey participants with the options of a traditional appointment time in which they would be given a specific time to be called (i.e., 8 am) and a time window where they would receive a call during a four-hour time window (ie, 8 am-12 pm). Seventy-eight percent of participants indicated that they would participate if their video visits were scheduled with traditional appointment times, compared to 41% if the appointment for time window appointments.

Table 3. Acceptance of Virtual Visits by Clinical Situation

Situations	N=130
First Visit to the Orthopaedic Surgeon	19 (15)
Planning or scheduling a surgery	66 (51)
Routine follow up for a problem seen for before	101 (78)
Routing post-surgery follow up	57 (44)
A post-surgery concern	57 (44)
Traditionally scheduled appointment	101 (78)
Time window schedule	53 (41)

Discrete Variables as number (percentage)

Discussion

While many published studies are showing that the utilization of remote video visits reduces the overall cost of orthopaedic and specialty care, few have explored the perceptions of patients and possible barriers to use (15-17). We gathered data to inform efforts to increase the utilization of remote video visits in musculoskeletal care.

This study has limitations. First, as a cross-sectional study of hypothetical willingness to participate in video visits, our conclusions may not reflect real-world choices. Secondly, to avoid survey fatigue, some potentially relevant demographic factors were omitted, such as education, insurance status, and income level. Additionally, a Spanish version of the survey was not created leading to a potential under sampling of our Hispanic population, however 21% of survey participants identified as Hispanic potentially limiting the effect of this limitation. We think these factors had a limited influence on the findings given the diversity of the sample population. Our results apply best to an urban university-based office setting with about 60% uninsured or underinsured patients, which may have distinct biases and more significant social barriers compared to other demographics. Additionally, this study was conducted before rapid changes related to COVID 19 pulled telehealth to the forefront of care in the U.S. It is unknown whether acceptance of video encounters may have shifted in response to a greater reliance on telecommunications platforms for other areas of daily life.

The observation that willingness to try a remote video visit was associated with perceived convenience of video

visits, and a decreased perceived importance of the physical exam points to characteristics of early adopter patients than can help a musculoskeletal telemedicine program become established. These findings are what one might expect, although the lack of association between willingness to try a video visit and age and distance of travel suggests the “convenience” of a video encounter cannot be anticipated with these factors. Furthermore, the lack of an association between interest in remote video visits and technology comfort demonstrates the value of measuring the most influential factors. The low percentage of people willing to have their initial visit via video suggests a general mistrust of the diagnostic capability of video visits and the ability to build the physician/patient relationship over a virtual platform which does not seem warranted based on several studies showing comparable quality (6-8).

The finding that previous experience with video visits increased engagement with future remote video visits likely reflects that the misconceptions and hesitations patients may have about remote video visits are often alleviated after participating in a video visit. This experience was also identified in video visit studies in family medicine and rheumatology (12, 18). During the COVID 19 pandemic, the medical field has rapidly expanded video visit capabilities and society as a whole has had to adapt to a greater reliance on telecommunications technologies in our daily lives. Knowing this, orthopaedic surgeons now have the opportunity to demonstrate the convenience of video visits to their patients and normalize the practice for routine musculoskeletal care moving forward.

The implementation of video visits into a musculoskeletal practice may be more successful among

people for whom an in-person appointment is difficult, however traditionally held barriers such as age, travel distance and technology comfort do not correspond with perceived convenience. Openness to remote video visits seems more related to trust that a specialist can give good advice without being in the same room and without a hands-on examination. Offering video visits for return patients may help jump start a telemedicine program and increase patient comfort with video visits, leading to increased utilization for other visit types in the future. Further work is needed to demonstrate the quality of physical exams performed during video encounters and to validate new maneuvers to facilitate those performed remotely. Moving forward, with the increased utilization of telemedicine and virtual care in response to COVID 19, patients are more likely to have been previously exposed to virtual care and therefore may be more willing to participate in these encounters. It behooves our profession to further develop skills and better platforms to facilitate this change on behalf of our patients.

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Harrison Miner BA¹

David Ring MD PhD¹

Karl M. Koenig MD MS¹

¹ Department of Surgery and Perioperative Care, Dell Medical School, University of Texas at Austin, Austin, TX, USA

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