

A Telehealth Initiative to Overcome Health Care Barriers for People Experiencing Homelessness

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Abstract

People experiencing homelessness (PEH) encounter barriers to health care, increasing their vulnerability to illness, hospitalization, and death. Telehealth can improve access to health care, but its use in PEH has been insufficiently evaluated. Needs assessment surveys completed by clients at an urban drop-in center for PEH (n=63) showed mental (58.7%) and physical (52.4%) health challenges were common, as was emergency department (ED) use (75.9%, n=54). Surveys collected after in-person and telehealth clinical visits showed patient satisfaction was >90% for both visit types (n=125, 44.0% telehealth and 56.0% in person). Without access to telehealth visits, 29.1% of patients would have gone to the ED and 38.2% would not have gotten care. Providers (n=93, 69.6% telehealth and 30.4% in person) were more likely to agree/strongly agree they made a positive impact on patients' health through telehealth (92.2%) than in person (71.4%) (p=0.019). Telehealth is a feasible and potentially cost-effective method to increase access to health care and reduce health outcome disparities in PEH.

Keywords: telehealth, telemedicine, homeless persons, health services accessibility, health care disparities, patient acceptance of health care

Introduction

In comparison with housed people, people experiencing homelessness (PEH) are three to six times more likely to experience illness, four times more likely to be hospitalized, and three to four times more likely to die pre-

maturely.¹ Contributors to these disparities include high rates of chronic medical conditions, mental health conditions, and substance abuse among PEH.² A national U.S. survey of nearly 3,000 PEH indicated that about one quarter of respondents were unable to receive the medical care they needed and approximately one third were not able to obtain their prescribed medications.² Barriers to equitable health care services include transportation, cost,³ and lack of insurance.²

In addition, housing instability is associated with high cost health care utilization patterns characterized by high rates of hospital-based care, low rates of ambulatory care,³ and increased acute care visits for nonemergent primary care conditions.⁴⁻⁶ Improved access is necessary to provide medical care to this vulnerable population in a cost-effective manner. Telehealth mitigates transportation barriers and has become an essential care delivery method during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. Telehealth is recommended by the Center for Disease Control for provision of primary care, nonemergent acute care, and chronic disease management,⁷ and it is essential that these modalities be used and evaluated in underserved populations to achieve equity in health outcomes.

Telehealth use globally has helped to decrease emergency department (ED) visits and conserve health care resources.⁸ Even before the SARS-CoV-2 pandemic, a 2019 digital health research study by the American Medical Association showed that increasing numbers of physicians from all specialties and demographics are adopting telehealth tools for patient safety and efficiency reasons.⁹ A 2014 Health-care Cost and Utilization Project survey of ED use among PEH found more than 75% of ED visits were in academic medical centers,⁶ making these institutions logical sites of origin for telehealth services to PEH. Video visits are among the telehealth tools with the greatest likelihood of adoption, and for primary care providers, video visits have been shown to have high rates of physician satisfaction and diagnostic agreement with in-person visits.¹⁰ Patients are also highly satisfied with primary care video visits and have even exhibited preference for video over office-based visits

due to decreased cost, transportation considerations, convenience, and decreased work absenteeism.¹¹ PEH have access to multiple forms of information technology that could be used for video visits, with greater than 60% of PEH having access to a cell phone or the internet and ~50% of the total PEH population having access to a computer.¹² Multiple studies have been promising in investigating the use of m-health in PEH,^{13–16} but barriers exist, including perceived lack of technical ability and lack of consistent mobile phone access.¹⁷

In light of the previous research related to use of telehealth and PEH, our initiative used video visits based out of a drop-in center to provide a consistent point of access to care. Our quality improvement project consisted of (1) a needs assessment survey administered to clients at the center and (2) patient and provider surveys for primary care visits conducted in person and through telehealth. Our goals were to (1) describe the demographics and health-related needs of PEH at this site, (2) determine the *feasibility* and (3) the *acceptability* for both patients and providers of telehealth visits as a care delivery method compared to in-person visits, and (4) evaluate the impact of both in-person and telehealth visits on health care access for this population. This project was conducted before the SARS-CoV-2 pandemic, but the relevance of our findings has been magnified in the current telehealth climate.

Methods

SETTING

The project site was an urban drop-in center in a mid-size southern city that provides legal, mental health, social work, and medical services for PEH. Medical services include a telehealth clinic staffed by a rotating group of 3 family medicine attending physicians from the Medical University of South Carolina (MUSC) and an in-person clinic staffed by a rotating group of 10 MUSC family medicine resident physicians. Patients are seen by scheduled or walk-in appointments for non-emergent primary care conditions. For the telehealth clinic, providers see patients remotely through an internet-based two-way audio/visual system. In addition to video capabilities, the telehealth equipment allows for the use of a remote stethoscope, ophthalmoscope, and dermatoscope. Trained pre-clinical medical students from MUSC serve as telepresenters, which involves registering patients in the electronic medical record, obtaining vital signs, and operating all telehealth equipment during the visit. Providers have both telehealth training and experience. Clients who present to center staff with a medical concern are referred to the soonest available

clinic time regardless of chief complaint, whether that is a telehealth or an in-person clinic, usually resulting in medical care within 24 h of presentation.

MEASURES AND PROCEDURES

Needs assessment survey. Clients at the center, regardless of whether they had a medical concern, were invited to take an anonymous paper survey, including demographic information, in addition to questions related to personal health, health care access, and technology access. This needs assessment survey was based on the Charleston YOUTH Count survey¹⁸ and was administered on 3 randomly selected days during times with high client volumes at the center.

Patient and provider surveys. Clinical surveys for patients and providers were developed using questions adapted from the previously validated Service User Technology Acceptability Questionnaire,¹⁹ which assesses domains of enhanced care, increased accessibility, privacy and discomfort, telehealth as a substitution for usual care, and satisfaction. Items were evaluated on a strongly agree to strongly disagree 6-point scale. The survey was adapted based on application for our patient population and clinical workflow. Surveys were piloted with the center's clients and the telehealth providers for comprehension and relevance. Patients were invited to complete online surveys in a private room immediately following their clinic visit on a single dedicated computer. Providers received automatically generated surveys through e-mail after each clinic session. Both patients and providers were invited to complete a survey for each visit, as opposed to one completion per person, to capture the experience of each visit. An initial question assessing prior survey completion was used to identify the total number of patients surveyed. Survey items related to health care access allowed patients to select more than one response option. Since these questions regarded the patient and not the visit itself, only patients for whom it was their first visit were considered.

ETHICAL CONSIDERATIONS

Neither needs assessment nor clinical surveys included any identifying information to maximally protect participant anonymity. All surveys were voluntary and patients and providers were invited to complete them after visits as to prevent any coercion. The study was exempt as quality improvement by the MUSC Institutional Review Board.

STATISTICAL ANALYSIS

For the needs assessment survey responses, frequencies were calculated for all questions and Chi-square analyses were calculated by race (Black vs. non-Black) and age (<50 years vs. ≥50 years) comparing self-reported overall health, presence of mental or physical challenges, addiction status, and tobacco use. These groups were picked to ensure adequate sample size for comparison and categories with too few answers were not included in the analysis.

For the clinical surveys, frequencies were calculated for all questions and Chi-square analyses were done for visit type (telehealth or in person) and all visit experience-related questions for patients and providers separately. Reasons for visit on provider surveys were write-in answers, which were categorized by the study team for analysis. Chi Squares were used to determine whether the reason for visit was associated with satisfaction or other clinical outcomes. Finally, since some patients had multiple visits, for questions pertinent to the patient and not the visit itself, the sample used for analysis only included surveys done after a first clinic visit at the drop-in center. Due to considerations for protection of anonymity, we were unable to link multiple surveys by an individual or patient and provider surveys for a given visit. All analyses were conducted in IBM SPSS Statistics 25.

Results

NEEDS ASSESSMENT SURVEY

A total of 63 individuals completed the survey, but not all questions were answered in each survey. The mean age of respondents was 48 years (age range: 19–71), and slightly >14% had served active duty in the U.S. Armed Forces. Other demographics are presented in *Table 1*. In terms of health care access, more than half (52.4%) did not have insurance, with more than half of those not having insurance for >1 year (54.3%). More than one third used the ED for their health care (38.1%), while 17.5% reported not getting health care. Three quarters (75.9%) had been to the ED in the past year with the majority accessing the MUSC ED (61.0%). Nearly one third (35.2%) had been hospitalized in the past year, with 32.9% of those hospitalized spending >1 week in the hospital (*Table 1*).

Table 2 presents health outcomes by age and race. More than half of respondents felt their overall health status was fair or poor (59.0%) with high rates of mental (58.7%) and physical health challenges (52.4%). Substance use was prevalent, and more than a third (34.9%) of smokers were interested in quitting.

Table 1. Demographics, Health Care Access and Utilization Reported by People Experiencing Homelessness in Needs Assessment Surveys (n=63)

DEMOGRAPHICS	%
Race	
Black	55.6
White	22.2
Native American	6.3
Multiracial	4.8
Hispanic	1.6
Other	6.3
Declined to answer	3.2
Gender	
Male	50.8
Female	44.4
3rd gender	1.6
Other	1.6
Declined to answer	1.6
Sexual orientation	
Heterosexual	81.0
Homosexual	1.6
Bisexual	6.3
Other	3.2
Unsure	1.6
Declined to answer	6.3
Education	
Elementary school	3.2
High school	57.1
College	22.2
Graduate school	7.9
Declined to answer	9.5
Employed	
Yes	22.2
No	73.0
Declined to answer	3.2
Health care access and utilization	
	1.0
Mode of health care access in general (n=62)	
ED	38.7
Doctor's office	21.0

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Table 1. Demographics, Health Care Access and Utilization Reported by People Experiencing Homelessness in Needs Assessment Surveys (n=63) continued

Free clinic	12.9
Urgent care	1.6
Other	8.1
Do not get health care	17.7
ED usage in past 12 months (n=54)	
Yes	75.9
No	24.1
Hospitalization in past 12 months (n=54)	
Yes	35.2
No	50.0
Do not know	14.8
Time spent in hospital of those reporting hospitalization (n=14)	
1 Week or less	57.1
Between 1 and 4 weeks	28.6
1 Month or more	14.3
ED, emergency department.	

The majority of those surveyed (71.4%) were interested in at least one health service (Table 3). With regard to technology access, more than half (50.8%) had access to a mobile phone, 71.4% to a computer, and 77.8% to the internet.

CLINICAL SURVEYS: PATIENTS

A total of 125 clinical patient surveys were completed (Table 4), 44.0% following telehealth visits and 56.0% following in-person visits. These data are from 85 patients who received services, as some patients were seen multiple times and completed surveys for each of multiple visits. Patient surveys showed high rates of satisfaction with both visit types (92.7% telehealth and 97.1% in person, $p=0.404$).

High proportions of respondents would have gone to the ED or not gotten care at all if they had not had access to telehealth services at the drop-in center (Table 5). These answers did not vary significantly by visit type ($p=0.158$).

For questions pertaining to health care access, 77.2% had e-visit (online questionnaire) selected as a way they would be comfortable contacting a doctor and 40.4% selected video visit from their phone. Slightly more than a quarter (26.3%) indicated that they would be comfortable with a video visit from the drop-in center and about a quarter (24.6%) chose in-

person (Table 6). When asked about ways patients would feel comfortable receiving information about their health, the greatest proportion of survey results indicated text message as an option (49.1%) followed by mailed letter (43.9%), email (38.6%), phone call (31.6%), or in person (7.0%) without significant differences between visit types.

CLINICAL SURVEYS: PROVIDERS

A total of 93 provider surveys were completed by 13 providers, 69.6% following telehealth visits and 30.4% following in-person visits. Surveys indicated strong agreement that providers were able to communicate adequately with patients for 98.4% of telehealth visits and 96.4% of in-person visits ($p=0.518$). For visits completed through telehealth, providers were more likely to agree or strongly agree that they made a positive impact on their patient's health than for in-person visits (92.2% vs. 71.4% in person, $p=0.019$). For 76.6% of telehealth visits, providers disagreed that visits would have been better if done in person. When looking at postvisit recommendations, only 2.2% of patients were referred to the hospital or ED.

The highest proportion of visits was for psychiatric complaints (27.2%). Only musculoskeletal complaint as the reason for visit differed by visit type with a higher proportion seen in person (25.0%) than through telehealth (6.3%) ($p=0.031$). For all telehealth visits for musculoskeletal complaints, providers indicated the visit would not have been better in person ($p=0.003$). None of the reasons for visit impacted satisfaction or outcomes.

Discussion

The current sample, consistent with prior studies, reported having a high incidence of chronic medical illness and psychiatric disorders, as well as substance addiction.^{1,4} Clients indicated a lack of health insurance at rates similar to the homeless population in the United States, but at levels more than six times that of the general U.S. population.²⁰ Sub-optimal access to medical care was evident with many utilizing the ED or not getting the care they needed when faced with a medical problem. There were also high rates of hospital admission, including frequent and extended inpatient admissions. Despite poor access to care, the population surveyed showed interest in services within the purview of outpatient primary care providers. Clients at the center reported high rates of technology access, including mobile phone, computer, and internet. This initial survey showed a population with both a need and a desire for primary medical care, a lack of current access to such care, and a connectedness to technology that could potentially be leveraged to address this issue.

Table 2. Health Outcomes as Self-Reported by People Experiencing Homelessness (n = 63)

	% ALL	% BLACK	% NON-BLACK	P	% <50 YEARS	% ≥50 YEARS	P
Overall health			(n = 61)		(n = 55)		
Excellent	9.8	5.7	15.4	0.594	15.4	3.4	0.247
Good	31.3	34.3	26.9		19.2	37.9	
Fair	49.2	56.7	50.0		57.7	48.3	
Poor	9.8	11.4	7.7		7.7	10.3	
Psychiatric disorders ^a			(n = 63)		(n = 56)		
Depression	50.8	51.4	50.0	1.0	57.7	50.0	0.601
Anxiety	34.9	22.9	50.0	0.034	50.0	30.0	0.172
PTSD	20.6	20.0	21.4	1.0	30.8	16.7	0.342
Chronic medical conditions ^b			(n = 63)		(n = 56)		
Hypertension	14.3	17.1	10.7	0.719	7.7	23.3	0.154
AIDS or HIV	9.5	14.3	3.6	0.214	19.2	0.0	0.017
Diabetes	7.9	8.6	7.1	1.0	7.7	6.7	1.0
Addiction status			(n = 63)		(n = 56)		
Alcohol	25.4	20.0	32.1	0.383	26.9	26.7	1.0
Cocaine	14.3	17.1	10.7	0.719	11.5	13.3	1.0
Pain medications (opioids)	7.9	2.9	14.3	0.162	3.8	13.3	0.358
Tobacco use			(n = 62)		(n = 56)		
Yes	67.7	68.6	66.7	1.0	73.1	60.0	0.399

Chi-square or Fisher's exact test within each category by race and age.

^aOther psychiatric disorders included bipolar disorder (n = 5), schizophrenia (n = 3), other personality disorder (n = 1), attention-deficit disorder (n = 1), and traumatic brain injury (n = 1).

^bOther chronic medical conditions included stroke (n = 3), heart attack (n = 1), traumatic brain injury (n = 3), cancer (n = 1), arthritis (n = 1), chronic obstructive pulmonary disease (n = 2), multiple sclerosis (n = 1), polyneuropathy (n = 1), and varied musculoskeletal disorders (n = 9). Traumatic brain injury appears in both because participants had the option to write in answers and did so as a psychiatric disorder without selecting it as a chronic medical condition.

PTSD, post traumatic stress disorder.

Table 3. Patient Survey Participants (n = 63) Who Indicated Being Interested in Additional Health Services

	%
Being set up with health insurance	30.2
Help quitting smoking	25.4
Help managing medical problems	23.8
Cancer screening	20.6
Nutrition counseling	15.9
Help overcoming substance abuse	15.9
Help overcoming alcohol abuse	12.7

Results from the patient and provider surveys further support the use of telehealth modalities to improve access for PEH. Patients and providers rated telehealth and in-person visits similarly in their ability to provide needed care. The overall satisfaction rate for both types of visits was high. As the type of care being provided did not seem to impact these results, it seems telehealth could be used broadly for the provision of primary care services. Based on the prevalence of psychiatric disorders, the use of telehealth for provision of psychiatric care for PEH should also continue to be evaluated in future studies, as this approach has been effective for the general population.

When asked about what telehealth modalities were acceptable for care, the highest proportion of respondents

Table 4. Self-Reported Patient Experience for Telehealth and In-Person Visits (*n* = 125)

SURVEY RESPONSES	TELEHEALTH (44%)	IN-PERSON (56%)	<i>P</i>
Overall satisfaction rate	92.70	97.10	0.404
Would recommend their visit type to individuals in similar situation	96.40	98.60	0.582
Felt visit type improved their health	90.90	85.70	0.42
Felt visits did not interfere with daily routine	92.70	97.10	0.404
Did not feel their visit made them uncomfortable physically or emotionally	81.80	92.90	0.094
Did not feel their visit invaded their privacy	92.70	97.10	0.404
Felt visit made it easier to get in touch with a doctor	96.40	97.10	1.000
Felt their visit saved them time	94.50	91.40	0.730
Felt their visit type could be used for their regular health care	90.90	94.30	0.505

selected e-visits. The largest proportion of patients selected text messaging as a way they would feel comfortable receiving health information. This is consistent with studies that have shown interest in and efficacy of text messaging for health reminders in PEH.²¹ Both texting and e-visits allow for asynchronous interactions with health care providers. These may seem especially useful to PEH, as they have the flexibility of not requiring a scheduled visit, since the messages can be sent at any time and reviewed at the individual's convenience. As medical care for this population often relies on volunteer efforts, asynchronous and remote visits

Table 5. Means by Which Patients (*n* = 55) Indicated They Would Have Gotten Care If Telehealth Services Were Not Available At the Drop-In Center

	%
Would not have gotten care	38.2
ED	29.1
Doctor's office	18.2
Urgent care	10.9
Other	3.6

Table 6. Patient Survey Responses (*n* = 57) Relating to the Preferred Way to Get in Touch with a Health Care Provider Based on the Type of Visit They Completed

	TELEHEALTH (%)	IN-PERSON (%)	<i>P</i>
Comfortable contacting a doctor by e-visit	92.1	47.4	<0.001
Comfortable contacting a doctor by video visit from their phone	63.2	28.9	0.021
Comfortable contacting a doctor by video visit at the drop-in center	53.3	46.7	0.108

may also increase convenience for providers and thus increase the overall ability to provide primary care to this population.

The potential impact on lowering the use of higher cost options for care is reflected in the study results. The largest proportion of respondents reported that they would have gone to ED or not gotten care if this service was not available, which is consistent with our needs assessment and previous studies of this population.⁴ This utilization pattern would be expected to result in the use of the ED for nonemergent conditions, or the avoidance of care until progression into a more severe condition. Notably, a very low number of patients needed referral to a hospital, pointing to the disproportionate use of the ED as a source of care for PEH. In this study, both in-person and telehealth visits were conducted at a site geographically accessible for PEH. For those who reported that they would have gotten care at a different site, it is important to consider transportation as a well-known barrier in this population and potential associated costs. Furthermore, the use of telehealth allowed providers more flexibility in their ability to provide care to patients, which is increasingly important in the current landscape of medical care for this largely uninsured group of patients. Thus, these results suggest that the program was feasible for both patients and providers and has the potential to improve care access.

There are several limitations to this initiative. The generalizability is limited by the single site nature and sample size (125 visits, 85 patients, and 13 providers), which prevented meaningful evaluation of subpopulations. Our question scope was limited to health and did not assess pertinent issues such as systemic racism, lack of access to affordable housing, and increased incarceration rates. Another limitation was our inability to link surveys completed by the same patient having more than one visit, which occurred because it was important to capture the experience of each visit and maximally protect

anonymity. This approach is consistent with many patient experience surveys used nationally. Visit types were conducted by physicians with different levels of experience, with resident physicians completing in-person visits and attending physicians conducting telehealth visits. This might have led to differences in telehealth assessment, as the attending physicians might be more comfortable with providing care to complex patients resulting in a more positive perceived impact of telehealth visits. However, in that case, they would also be more able to identify where telehealth was inadequately providing care. Thus, despite the difference in training level, the provider surveys do at least reflect an equivalence of in-person and telehealth care. While high rates of technology access were reported, we did not assess the sustainability of those access points and previous studies have shown inconsistent connectedness to technology. While this might impact translation to other forms of technology, our findings reflect a drop-in center-based telehealth initiative that could be scaled to similar facilities serving PEH, providing a central hub for access.

Conclusion

The survey results demonstrate that telehealth is a health care delivery method for PEH that is feasible, is accepted by patients and providers, and increases access to health care. Using telehealth to increase access to care has the potential to reduce disparity in health outcomes for this vulnerable population and modify high cost health care utilization patterns. Future directions include incorporation of medical student clinical training, resident physician telehealth training, and integration with mental health services.

Authors' Contributions

C.S.A., M.S.P., C.R.B., and V.A.D.: study design, data collection, data analysis, drafting, and editing of article. S.P.: data analysis, drafting, and editing of article. J.F.: data collection and data analysis. L.W., E.B., and C.R.: data analysis, drafting, and editing of article.

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