Williams, Victoria (County Judge's Office)

From: ShaTerra Fairley <sfairley@hivtrg.org>
Sent: Friday, February 8, 2019 11:32 AM
To: Harbolt, Amber (County Judge's Office)
Cc: Williams, Victoria (County Judge's Office); Beck, Diane (County Judge's Office)
Subject: Re: February Steering Committee Question

Good Morning,

We've been working on implementing telemedicine/health for some years now. We have a new Clinical Consultant that will be initiating some projects in our rural areas. He has experience with doing telehealth in West Texas.

Planning is Essential,

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Original Paper

Physician's Perceptions of Telemedicine in HIV Care Provision: A Cross-Sectional Web-Based Survey

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Abstract

Background: Telemedicine, or electronic interactive health care consultation, offers a variety of benefits to both patients and primary care clinicians. However, little is known about the opinions of physicians using these modalities.

Objective: The aim of this study was to examine physician perceptions, including challenges, risks, and benefits of the use of telemedicine in human immunodeficiency virus (HIV) patient care.

Methods: A Web-based, self-administered, anonymous, cross-sectional survey was sent to physicians known to be providing medical care to patients living with HIV in Ontario, Canada. Descriptive statistics and frequencies were used to examine physician perceptions and characteristics of participants.

Results: Among the 51 invited participants, 48 (94%) completed the survey. Sixty-two percent (29/47) of respondents reported that they used some form of telemedicine to care for HIV patients in their practice. Of the respondents who identified as having used telemedicine in their practice, telephone (86%, 25/29), email (69%, 20/29), and teleconsultation (24%, 7/29) were listed as frequent modalities used. A significant number of physicians (83%, 38/46) agreed that an obstacle to adopting telemedicine is their perception that this modality does not allow for a comprehensive assessment of their patients' health. In addition, 65% (28/43) of physicians agreed that patients may not feel adequately connected to them as a provider if they used telemedicine. However, 85% (39/46) of respondents believed that telemedicine could improve access and timeliness to care along with increasing the number of times physicians can interact with their patients.

Conclusions: From the perceptions of physicians, telemedicine shows promise in the care of patients living with HIV. More than half of the respondents are already using telemedicine modalities. Whereas many physicians are concerned about their ability to fully assess the health of a patient via telemedicine, most physicians do see a need for it—to reduce patient travel times, reduce exposure to stigma, and improve efficiency and timely access to care. Challenges and risks such as technological gaps, confidentiality, and medicolegal concerns must be addressed for physicians to feel more comfortable using telemedicine.

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KEYWORDS

HIV; AIDS; telemedicine; health surveys

Introduction

Telemedicine, or electronic interactive health care consultation, offers a variety of benefits to both patients and primary care clinicians [1]. Telemedicine encompasses a wide variety of health care services, and with the current advances in technology, these services are quickly evolving and becoming more affordable and accessible. Telemedicine models are also wide ranging: from live synchronous connections between two or more parties in a health encounter to asynchronous training modules; from programs delivered with a desktop in one place to just-in-time learning delivered via mobile devices [2-4]. In all of these cases, there are a variety of potential obstacles and challenges such as technical (eg, type of device and data plans), administrative (coordination and support), financial (costs of technology), and cultural (affinity with some media over other) [5]. The complexity of the illness is a barrier that also needs to be addressed when identifying which telemedicine model is most appropriate to use. Although telemedicine is promising in the provision of services to patients, the evidence remains limited and inconsistent [5].

Human immunodeficiency virus (HIV) is a highly complex chronic illness and should be thought of as a myriad of conditions and not one single issue. Many patients suffering from HIV are also afflicted with physical and psychological impairments, making the use of telemedicine in this population a strong compliment to current treatment options [6,7]. Although various telemedicine modalities are well received by patients—including people living with HIV—due to its convenience, ability to increase confidentiality, and reduce stigma, little is known about what physicians providing HIV care think about telemedicine [8-11]. The uptake of telemedicine services relies on system structures being embedded within medical practice and physicians playing a pivotal role in adopting the technology [12,13]. Physicians' acceptance of telemedicine is essential in its use, and thus understanding physicians' perceptions on the use of, and the skills required to use telemedicine to care for those living with HIV, may help identify the perceived challenges, risks, and benefits to the uptake of its many modalities. Additionally, identifying physician characteristics may shed light into how often HIV care providers use telemedicine and what impact it has on their practice and on the health of patients. Accordingly, the purpose of this study was to explore how physicians perceive the use of telemedicine in HIV care in the province of Ontario. This is a necessary entry point into understanding whether HIV disease itself can and must be treated using telemedicine or specialized physicians in general, who use telemedicine, need to be trained in the complexity of HIV to better serve those they see who happen to be HIV positive as well.

Methods

Participants

Physicians who were providing medical care to people living with HIV in Ontario, Canada were asked to complete a Web-based, self-administered, and anonymous survey regarding the use of telemedicine in HIV care.

Recruitment

A list of all registered infectious disease specialists in the province (n=218) was obtained via the College of Physicians and Surgeons of Ontario. Of these, 51 individuals were identified as providing HIV-specific care. A link to the survey was emailed to these individuals. In addition, 2 additional email reminders were circulated 1 week apart to get as many responses as possible.

Eligibility Criteria

Only physicians practicing in Ontario and who have HIV patients in their care were included in this study. All participants provided informed consent.

Data Collection

A total of 48 participants completed a cross-sectional survey hosted by FluidSurveys [14]. Questions were designed in consultation with HIV researchers, program evaluators, HIV educators, distance education specialists, community leaders living with HIV, and physicians with expertise in providing telemedicine services as well as HIV care.

The aims of the survey were to better understand current practices and perceived risks, benefits, and challenges in using telemedicine in HIV care. To do this, questions were organized into 5 sections: (1) general concepts of telemedicine, (2) perceived challenges to telemedicine use, (3) benefits of telemedicine, (4) perceived risks of telemedicine, and (5) information about the health care provider and their practice and patient population.

Analysis

Data were analyzed using descriptive statistics and frequencies to examine the characteristics of invited participants and their responses to the survey items. Data are presented as total counts and percentages. For simplicity, physician perceptions were dichotomized by aggregating the categories "agree" and "strongly agree" to "agree" in the text, while "disagree" and "strongly disagree" were combined to "disagree." In addition, "minor," "moderate," and "severe" barriers were consolidated to "barrier" in the text. Data synthesis and statistical analyses were performed using R 3.2.3 (R Core Team, Vienna Austria) [15].

Ethics

This study was approved by the Research Ethics Board at St Michael's Hospital in Toronto, Canada (REB#15-337). Per our study protocol, participation was completely voluntary. All questions were self-administered and anonymous. Participants were not compensated for completing the survey and were free to withdraw or not answer any questions they did not want to with no professional or other consequences.

Results

Recruitment and Participation

Of the 51 physicians who were invited to take part in the Web-based survey, 50 (98%) consented to participate in the study. Two physicians who consented were removed because

they did not answer any of the survey questions. All questions had 10% or fewer missing items, with most having only 4% missing.

Demographic Characteristics of Respondents

Physician characteristics are presented in Table 1. About half of the invited physicians were generalists (44% family physician, 2% internal medicine, and 2% pediatrics), whereas 36% of physicians were specialists in infectious diseases and 9% were psychiatrists focusing in HIV. The majority of respondents primarily practiced in the Greater Toronto Area (69%) and represented a broad range of years in practice with 78% of physicians having at least ten years of experience. The respondents each represented a varying caseload of HIV patients.

HIV Care Providers' Use of Telemedicine

More than half of the physicians (62%, 29/47) reported that they used some form of telemedicine to care for HIV patients in their practice. Eighteen (38%, 18/47) respondents stated that they have never used telemedicine in their practice. Of the 29 respondents who were identified as having used telemedicine in their practice, telephone (86%, 25/29), email (69%, 20/29), and teleconsultation (24%, 7/29) were listed as frequent modalities used to care for patients. HIV care providers were more likely to use the telephone (69%, 20/29) to care for their patients as opposed to email (21%, 6/29) and teleconsultation systems (10%, 3/29; Table 1).

When requiring the assistance of a specialist in order to care for HIV patients, about half of the physicians (55%, 26/47) reported that they used telemedicine in order to consult with specialists. However, 21 respondents (46%, 21/47) stated that they have never used telemedicine to contact a specialist. The primary modalities used to consult with a specialist by the 26 respondents were email (58%, 15/26) and telephone (38%, 10/26).

Table 1. Characteristics of participants (N=48).

Participant characteristics	Number of respondents n (%)
Location of practice, n=48	
Toronto or Ottawa	37 (77)
Other locations in Ontario	11 (23)
Type of physician, n=45	
Family medicine	20 (44)
Infectious disease	16 (36)
Other (ie, internal medicine, psychiatrist, etc)	9 (20)
Years in practice, n=45	
<10	10 (22)
10-15	8 (18)
16-24	12 (27)
≥25	15 (33)
Percentage of patient case load that are people living with HIV[a] , n=45	
< 25%	14 (31)
25-49%	12 (27)
50-74%	9 (20)
75-100%	10 (22)
Modalities of HIV telemedicine currently used, n=29	
Phone consultations	25 (86)
Email consultations	20 (69)
Teleconsultation systems	7 (24)
Other (ie, instant messaging software)	1 (3)
Current use of telemedicine services, n=48	
Never or rarely	29 (60)
Sometimes	11 (23)
Often	7 (15)

[a]HIV: human immunodeficiency virus.

Twenty-six physicians (55%, 26/47) felt that there was a need to expand the use of HIV telemedicine services in Ontario; however, 20 physicians (43%, 20/47) were unsure of the need for an expansion of HIV telemedicine services, with 1 physician expressing a negative response to the development of telemedicine services in Ontario. Whereas only 26 physicians expressed interest in developing telemedicine services for HIV patients, many physicians (28/46, 61%) stated they served patients who could benefit from telemedicine. There were also a significant number of physicians who stated that they provided care to a number of patients who had difficulties traveling because of physical disabilities or mental health issues (82%, 37/45 and 72%, 34/47 respectively). Also, 74% (34/46) of those surveyed stated they had patients who traveled more than 100 kilometers for a visit.

Physicians Perceived Challenges to Telemedicine Use in Their HIV Patients

Physicians endorsed various challenges relating to the use of telemedicine when caring for HIV patients (Table 2). Most notably, 83% (38/46) of physicians felt that they could not adequately assess the health of a patient via telemedicine. Sixty two percent (28/45 respondents) reported that telemedicine took too much time, and 60% (27/45 respondents) felt they lacked the technology to use telemedicine in their practice. The majority of respondents (76%, 34/45) believed that their patients did not have access to the necessary equipment needed to use telemedicine services. Many physicians cited other challenges such as confidentiality (60%, 27/45), lack of remuneration (62%, 28/45), concerns that patients will abuse telemedicine services (71%, 32/45), and medicolegal concerns (51%, 23/45). However, an absence of patients that would benefit from telemedicine was not identified as a barrier; 75% (33/44) of physicians stated that lack of need did not prevent them from using telemedicine.

Perceived Risks of Using Telemedicine in Patients With HIV

Respondents expressed opinions regarding the perceived risks of using telemedicine for patients living with HIV (Table 3). Many respondents (65%, 28/43) agreed that patients may not "feel adequately connected" to them as a provider with the use of telemedicine. Fifty-eight percent (25/43 respondents) agreed that HIV patients would receive poorer quality assessments with the use of telemedicine. However, most physicians (77%, 33/43) disagreed with the statement that HIV patients would feel more social isolation with the use of telemedicine. Also, the majority of the respondents (67%, 29/43) disagreed with the statement that remote patients would lose the opportunity to come visit their practice.

Perceived Benefits of Using Telemedicine to Care for HIV Patients

The majority of physicians stated that HIV patients would benefit from the use of telemedicine (Table 4). There was unanimous agreement among respondents (100%) when assessing telemedicine's ability to reduce patients' travel times. Eighty-three percent (38/46) of respondents agreed with the premise that using telemedicine can reduce a patients' exposure to the stigma of having HIV. Additionally, 65% (30/46) of respondents agreed that the use of telemedicine can increase the patients' privacy. Many physicians also agreed that both the quality of care (61%, 28/46) and efficacy of patient care (67%, 31/46) could improve in HIV patients through the use of telemedicine. Eighty-five percent (39/46) of respondents agreed with the statement that telemedicine will be able to increase the number of times patients are able to interact with their physician as well as agreed with its ability to improve access and timeliness to care.

Table 2. Participants' perspectives on challenges to using telemedicine.

Perceived challenges to using telemedicine	No barrier n (%)	Minor barrier n (%)	Moderate barrier n (%)	Severe barrier n (%)
It takes too much time	17 (38)	20 (44)	6 (13)	2 (4)
I lack access to the necessary technology	18 (40)	9 (20)	15 (33)	3 (7)
I have no patients that require telemedicine services	33 (75)	7 (16)	1 (2)	3 (7)
Most of my patients do not have access to the necessary equipment for telemedicine	11 (24)	12 (27)	19 (42)	3 (7)
I have concerns about confidentiality	18 (40)	17 (38)	7 (16)	3 (7)
There is too much diversity in my practice to adopt telemedicine as a regular practice	26 (58)	13 (29)	5 (11)	1 (2)
I cannot adequately assess a patient using telemedicine	8 (17)	19 (41)	15 (33)	4 (9)
I have concerns about remuneration for telemedicine	17 (38)	12 (27)	10 (22)	6 (13)
I worry that patients will abuse the use of telemedicine to communicate with me	13 (29)	16 (36)	15 (33)	1 (2)
I have medicolegal and licensing concerns about using telemedicine	22 (49)	15 (33)	8 (18)	0

Table 3. Participants' perspectives on risks of telemedicine.

Perceived risks of using telemedicine	Strongly disagree n (%)	Disagree n (%)	Agree n (%)	Strongly agree n (%)
I am concerned that telemedicine will increase the social isolation experienced by people living with HIV[a]	4 (9)	29 (67)	7 (16)	3 (7)
Patients may not feel adequately connected to me as a health care provider	3 (7)	12 (28)	22 (51)	6 (14)
Patients will receive lesser quality assessments	3 (7)	15 (35)	20 (47)	5 (12)
Patients may not understand my instructions	3 (7)	20 (47)	19 (44)	1 (2)
Remote patients will lose the opportunity to come see me in person if they prefer it	3 (7)	26 (60)	13 (30)	1 (2)

[a]HIV: human immunodeficiency virus.

Table 4. Participants' perspectives on benefits of telemedicine.

Perceived benefits of using telemedicine	Strongly disagree n (%)	Disagree n (%)	Agree n (%)	Strongly agree n (%)
Reduces their exposure to stigma (in rural areas, for example, acquaintances or family would not see them visit medical services)	0	8 (17)	34 (74)	4 (9)
Increases their privacy	0	16 (35)	26 (57)	4 (9)
Reduces travel time	0	0	15 (33)	31 (67)
Improves quality of patient care	1 (2)	17 (37)	21 (46)	7 (15)
Improves efficacy of patient care	0	15 (33)	22 (48)	9 (20)
Increases the number of times we can interact	0	7 (15)	29 (63)	10 (22)
Improves access and timeliness to care	0	7 (15)	28 (61)	11 (24)

Discussion

Principal Findings

The aim of this study was to help describe physicians' perceptions of the use of telemedicine to care for patients living with HIV and the perception they have of their patients' use of telemedicine; the barriers and facilitators. In terms of benefits, physicians agreed across the board that telemedicine services would decrease travel times and could likely reduce patient experience of HIV-related stigma at appointments. Physicians also felt that telemedicine would increase access and efficiency of care, while benefiting patients who have difficulty travelling due to physical and mental impairments.

We discovered some consistent trends when evaluating the perceived challenges physicians reported to using telemedicine in their practice. Physicians most notably reported apparent issues around lack of time for telemedicine, lack of necessary technology for the patient and the provider, as well as concerns about confidentiality, remuneration, and inability to adequately assess patients using the service. These results echo some of the current sentiments regarding the uptake of telemedicine into general medical practice [1-5]. Physicians were also concerned about patients not feeling adequately connected to them as a health care provider when using telemedicine, and to a lesser extent, believed that patients would receive lesser quality assessments.

Although there was consistent agreement around possible benefits of telemedicine for HIV care, our findings highlight many perceived challenges and risks that must be addressed before HIV telemedicine is likely to expand dramatically in practice. Confidentiality, privacy, and remuneration were reported as key challenges to physicians adopting telemedicine in Ontario. These challenges may primarily be due to a lack of information on the physicians' part in regards to the telemedicine services at their disposal and have less to do with regulation limitations, or limitations of the technology. Previous research has shown that physicians are less likely to use telemedicine services on a regular basis if they are not adequately compensated for their time and effort [13,16]. Addressing these perceived barriers to the implementation of telemedicine services is a complex problem that requires assistance from many sources including health care institutions, policy makers, physicians, and patients alike.

Some of these data reflect current themes in distance education; the impact of in-person consultation is glamorized, whereas "Web-based presence" is misunderstood as impersonal. In many responses, it seems that physicians fear that the introduction of telemedicine into practice will be a replacement to in-person consultations and not a compliment to current practices. The nature of HIV as a complex syndrome of various clinical manifestations may also be contributing to the physicians' hesitation to endorse telemedicine. For example, people living with HIV may have complex social, financial, and psychological concerns that seem less amenable to telemedicine techniques when a provider is inexperienced with these remote modalities.

In Canada, the Canada Health Infoway, which is a national initiative, was created to expedite the development and adoption of telemedicine services while addressing reported barriers to

the implementation of eHealth systems. Through the use of provincial partners like the Ontario Telemedicine Network, the infrastructure is in place to provide telemedicine services to those receiving care for HIV. The use of telemedicine to treat other chief health complaints has shown positive results as evidenced by the success of Telehomecare, Telestroke, and Teledermatology programs in Ontario [17].

Telemedicine networks in Canada offer education for physicians and their staff around remuneration, the technology of telemedicine, as well as ways to incorporate telemedicine alongside in-person care. Physicians and health care providers may need ongoing training and support in the form of distance educational sessions to gain up-to-date and meaningful instruction on the benefit of telemedicine services and how to seamlessly integrate them into their practices. By providing physicians with evidence-based research on the growing need for innovative care and the benefits of implementing telemedicine services, their perspectives may change and allow for a greater adoption of the service in HIV care provision.

Limitations

In terms of collecting respondent characteristics, we collected few demographic identifiers in order to protect confidentiality of northern providers that may be using telemedicine more often or more proficiently than tertiary providers. We also did not gather the ages or genders of physicians who responded in our survey, which could possibly be a predictor of telemedicine perceptions. We also were not able to gather opinions of all physicians practicing HIV care in Ontario, as there is not a full, up-to-date registry of these physicians.

Conclusions

From the perceptions of physicians, telemedicine shows promise in the care of patients living with HIV. More than half of the respondents are already using telemedicine. Whereas many physicians are concerned about their ability to fully assess the health of a patient via telemedicine, most physicians do see a need for it to reduce patient travel times, reduce exposure to stigma, and improve efficiency and timely access to care. Challenges and risks such as technological gaps, confidentiality, and medicolegal concerns must be addressed for physicians to feel more comfortable using telemedicine. Further research is warranted to determine the levels and needs for training of physicians and patients on various telemedicine modalities and technologies. Also, there is a need to compare and contrast the data collected with research evidence in telemedicine uptake in other health areas such as wound care, diabetes, and counseling.

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Authors' Contributions

Authors KA, TF, FIC, and JG were extensively involved in the creation and distribution of the survey, analysis of results, and drafting of the manuscript. All authors read and approved the final manuscript.

Conflicts of Interest

None declared.

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Abbreviations

HIV: human immunodeficiency virus

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Telemedicine for Depression in Older People Living with HIV

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Abstract

Objective: The aims were to evaluate older HIV+ participant initial amenability towards telemedicine, change in amenability post-session, and clinician impressions of conducting the interview (including the Hamilton Depression Rating Scale (Ham-D)) via telemedicine. This paper focuses specifically on telemedicine as videoconferencing.

Methods: This 2-phase study evaluated telemedicine in an urban setting to people living with HIV (PLWH) aged 50+ with mild-moderate depression based on the Patient Health Questionnaire (PHQ-9). Initial perception on telemedicine was collected during Phase I. Amenable participants who completed Phase I engaged in an actual home-based telemedicine (HBT) session during Phase II, after which their perception was measured again.

Results: 41 subjects completed Phase I; 25 completed Phase II. Among Phase II completers, analysis using paired t-tests and chi-squared tests demonstrated a significantly improved outlook towards telemedicine after the session, including comfort with perceived privacy ($p=0.001$), overall satisfaction ($p<0.001$), and preference for telemedicine over in-person consultation ($p<0.001$). Those who were not amenable to scheduling a telemedicine session were more likely to be unsure about the privacy of such sessions (44% vs. 8%, $p=0.011$). Clinician questionnaires further supported the utility of telemedicine for clinical assessment.

Conclusion: Telemedicine with use of standardized assessments is a clinically viable means to evaluate depression in HIV-positives aged ≥50 with mild-moderate depression. Systems of care in HIV psychiatry may consider use of home-based telemedicine when expanding clinical services for this growing population, particularly those with barriers to participate in usual in-person clinical care.

Keywords: HIV; Depression; Telemedicine; Telepsychiatry

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Introduction

With the advent of highly effective antiretroviral drugs, HIV has changed from an often terminal illness to a chronic disease. Consequentially, HIV is increasingly affecting older adults [1,2]. To compound this issue, older PLWH often manifest psychiatric comorbidities, with depressive disorders among the most common [3-6]. Telemedicine is an increasingly common model of care delivery, particularly for patients with logistical barriers to in-person specialty care. To date, there have been no studies reporting the use of telemedicine to assess depressive disorders in older PLWH in an urban setting.

Older PLWH: A growing demographic with more challenges

Over the past two decades, the number of PLWH who are 50 years and older has increased greatly [1,2]. This trend has been described as the "graying" of the HIV/AIDS epidemic [7]. Due to the common misperception of HIV/AIDS as a disease afflicting younger people, older PLWH have been referred to as a "hidden population" [8].

Older PLWH may experience a more acute sense of stigmatization, difference, and exclusion from their social sphere due to their age, which may discourage them from seeking treatment [9].

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Compared to younger PLWH, older PLWH express greater unhappiness, negative life events, perceived stress, and negative attitudes about aging [10,11]. Additionally, older PLWH are more likely to experience social isolation, depressive symptoms [12], and HIV-related stigma, which may be associated with internalized shame and blame and reduced quality of life [13-15]. Similar results were found when comparing HIV-positive and HIV-negative older people–older PLWH reported less happiness, less resilience, lower physical and mental health, and poorer attitudes towards aging, as well as more negative life-events, anxiety, and perceived stress [16].

Depressive disorders in older PLWH

Depressive disorders represent a common psychiatric comorbidity among PLWH [3-6] and are associated with accelerated HIV disease progression [17,18], decreased immune functioning [17,19], HIV medication non-adherence [20], and premature death [21,22]. Older PLWH often experience mild to moderate depressive disorders such as dysthymic disorder and "minor" depression [23]. Some studies indicate depression prevalence as high as 52% for older PLWH [24], while others show that older PLWH are five times more likely to experience depression compared to HIV-negative peers [25]. The high rates of depression in older PLWH are especially disconcerting since this cohort is less likely than their younger counterparts to seek treatment [26].

Telemedicine as a clinical option

In order to treat the rising number of PLWH and their associated comorbidities, new models of care have been developed. The last two decades have seen a rising interest in delivering mental healthcare by means of advanced technologies. With a growing availability of modern communications technology, telemedicine–the incorporation of a telecommunication device in the diagnosis and overall care of patients who are geographically separated from the physician [27]–is a viable alternative. For the purpose of this paper, telemedicine refers to the provision of psychiatric services via live, interactive videoconferencing technology.

Previous studies have demonstrated that treatment of depression via telemedicine compared to in-person treatment resulted in comparable outcomes, including equivalent levels of patient adherence, patient satisfaction, and healthcare costs [28]. A meta-analysis conducted by Mohr et al. showed significant reductions in depressive symptoms across all assessment periods among individuals who engaged in telephone-administered psychotherapy compared to usual care [29]. Comparable results were also reflected in the accuracy of diagnosis. Singh et al. investigated psychiatric care for rural individuals and found that only 1-2% of patients were diagnosed incorrectly when using telemedicine [30].

Telemedicine has been successfully integrated into psychiatric care in several different settings, including rural areas and correctional facilities. Although individuals living in rural settings face greater barriers to healthcare access, such as geographic and transportation factors, high treatment costs, and time limitations, research has supported the use of telemedicine as a means to increase healthcare accessibility to rural residents. Johnston and Jones noted both flexibility and improvements to accessibility that telemedicine offered to patients in a rural nursing home over a 2-year period [31].

Telemedicine has also been shown to fulfill the needs in correctional settings where lack of appropriate mental healthcare is a common issue. Khalifa et al. demonstrated that use of telemedicine can overcome issues related to travel, accessibility, continuity of care, public safety and security, and transportation costs [32]. Research on telemedical services in rural and correctional settings is well-documented; however, additional research is required to explore the impact of telemedicine in an urban setting.

Barriers to healthcare in urban settings can be just as burdensome as those seen in rural areas. Additional challenges to care delivery that are often reported, most commonly among Hispanic populations, include language barriers, immigration status, cultural practices, and unfamiliarity with maneuvering around the healthcare system [33]. This has resulted in delayed delivery of treatment in urban populations and/or use of local emergency departments for primary care [34], causing greater inefficiency and higher costs for the healthcare environment. Other barriers to obtaining in-person care in urban settings include patients with limited mobility, lack of access to an automobile, less-than-convenient access to public transit, cost of transit and parking for impoverished patients, and stigma for being seen in certain clinic settings. Spaulding et al. reported that as of 2011, only about 2% of the current publications on telemedicine programs and research described urban telemedicine health services. With a greater capacity to leverage telemedicine health for more patients and a better equipped infrastructure to provide technical and clinical support, more research needs to focus on urban telemedicine [35].

The current study aimed to analyze older PLWH with depression in an urban setting and how they perceive telemedicine. Additionally, the study examined changes in perception and acceptance of telemedicine after participants engaged in an actual telemedicine session and clinician opinion on using the Ham-D via telemedicine (with particular attention to the interpretation of items 1, 8, 9 and 10, which require clinician interpretation of the patient's physical appearance).

Methods

The current 2-phase study sought to evaluate the provision of clinical services through home-based telemedicine (HBT) in an urban setting to a cohort of older PLWH ≥ 50 years of age with mild to moderate major depression based on the PHQ-9, or a score of 5-14, inclusive.

Participants and procedures: Phase I

UC San Francisco's (UCSF) Committee on Human Research granted study approval in March 2014, after which recruitment was initiated. Initially, only patients from 360: The Positive Care Center (360) at UCSF were recruited as this clinic focused primarily on the treatment of PLWH. Based on patient records, patients at 360 who met the inclusion criteria for the study were identified and then contacted by the clinic's social worker by telephone.

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Due to slow enrollment into the study, recruitment was opened up to various HIV clinics across San Francisco in order to expedite the process.

Recruitment letters and flyers were circulated among the participating clinics and interested individuals could respond on their own initiative. A member of the research team replied to the inquiries by contacting individuals via telephone. Interested individuals were then screened and eligibility was determined based on the following: ≥50 years of age, San Francisco resident, HIV-positive, and PHQ-9 score. The research member conducted the PHQ-9, a diagnostic instrument used to screen, monitor, and measure the severity of depression, during the phone call to confirm each individual's current psychiatric status and to ensure that each individual fell within the targeted parameters of the depression scale. Although the research member had limited clinical background, the study psychiatrist determined that screening in this fashion was still valid since the PHQ-9 is normally a self-administered test and is commonly conducted over the phone. Participants that did not fall within the desired range (a score of 5-14, inclusive) were screened out. Those whose score was greater than 14 were directed to seek psychiatric care promptly **(Figure 1)**.

Eligible participants received informational material via email or postal delivery that further described telemedicine in order to establish a baseline level of understanding. Participants were given 3 days to review the material on their own, after which a research team member contacted them to confirm understanding of the material and to conduct the Patient Perception Questionnaire (PPQ), which aimed to assess each participant's perception of telemedicine. Because Phase I only involved collecting participant feedback on their perceptions of and amenability toward telemedicine, individuals were not excluded from this study on the basis of alcohol or substance use disorders, cognitive status, or current psychotherapy or pharmacotherapy. Likewise, an informed consent was not conducted for Phase I as determined by UCSF's Committee on Human Research due to the minimal risk associated with participation.

Participant amenability towards receiving telemedicine was also recorded prior to HBT session during Phase II. Amenability was defined as a participant's willingness to participate in an actual HBT session, which would take place during Phase II of the study. Sample size for Phase I was determined by a preliminary assessment of the data after 12 months of enrollment to see whether there was statistical significance at that point in the study. Given the sample size and data at this point in the study, statistical power was confirmed. Participants received a $10 food voucher for completing Phase I of the study.

Measures

The Patient Health Questionnaire or PHQ-9 [36] is a widely used multipurpose, self-report measure for screening, diagnosing, and monitoring the severity of depression. It was conducted during the first phone call to determine the current state of mental health among respondents in order to determine eligibility. Total scores can range from 0 to 27, with higher scores indicating greater symptom severity.

The Patient Perception Questionnaire or PPQ that was administered at the end of the second phone call was based on The Duke Telemedicine Project Patient Satisfaction Survey and the UC Davis Health System Telemedicine Clinical Consultation Patient Satisfaction Survey. Permission to modify the surveys for the purposes of the study was collected from the appropriate parties before implementation. Participants were asked about their previous experience with telemedicine, then rated a series of statements regarding their perception on telemedicine on a 5-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree") as seen in **Tables 1 and 2**. The PPQ concluded with a question about participant likelihood of engaging in a telemedicine consultation and an opportunity to schedule a real session with a psychiatrist to assess participant amenability.

Participants and procedures: Phase II

During this phase, amenable participants who completed Phase I engaged in an HBT session at their home. 360 was offered as

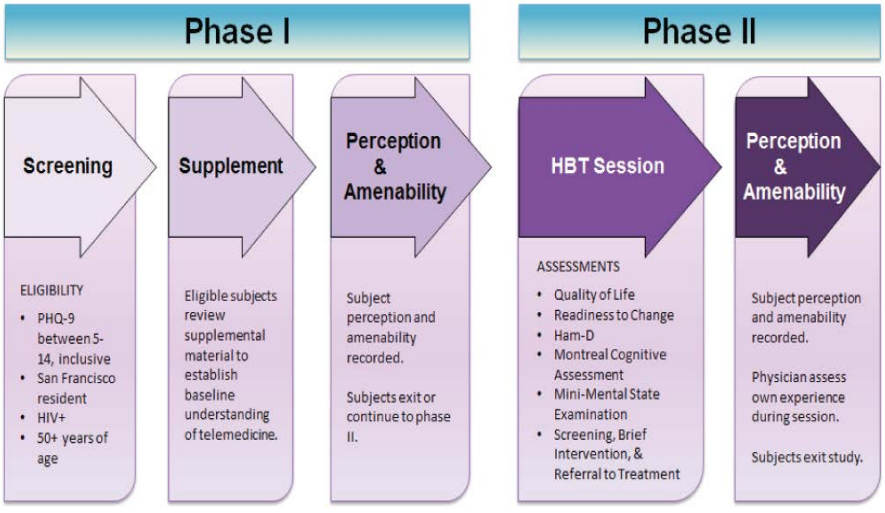

Figure 1 Study flow.

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an alternate, private location for those who preferred to hold the session elsewhere as the study team anticipated that some individuals may feel uncomfortable holding the study visit at their home due to lack of privacy. During the HBT session, a research member with IT specialty and a social worker set up the telecommunication devices, which included UCSF-provided laptops, WiFi, and Cisco Jabber (two-way video). Afterwards they left the room to maintain privacy between the participant and study physician. A similar protocol was followed for individuals who chose to have their session at 360 where the physician would manage the session from a private office in a separate building. Two members went together for personal safety and in case any mental health crisis arose during the interview. The members were prepared to contact the San Francisco mobile crisis team or the police in case of any suicidal ideation, homicidal ideation, or other possible psychiatric crisis.

During the session, the study physician guided the participant through an informed consent form specific to Phase II and administered the Quality of Life and the Readiness to Change surveys. Then the study physician conducted the clinical interview during which the Hamilton Rating Scale for Depression (Ham-D), a clinician-administered depression rating instrument, was administered in order to further assess depression symptoms. The clinical interview also included the Screening, Brief Intervention, and Referral to Treatment (SBIRT) in order to determine each participant's substance abuse history and an assessment for any other psychiatric co-morbidity. The Montreal Cognitive Assessment (MoCA) and the Mini-Mental State Examination (MMSE) were both administered in order to determine participants' current cognitive status. Each participant then completed a Post-HBT Patient Perception Questionnaire (PHPPQ) regarding their satisfaction with the HBT session while the physician completed his or her own survey to collect their perspective on the session. Sample size was based on the number of participants who were amenable to continuing the study after completing Phase I. Participants received a $20 food voucher for completing Phase II of the study.

Measures

Quality of Life Enjoyment and Satisfaction Questionnaire–Short Form or Q-LES-Q-SF [37] was administered by the study psychiatrist during the HBT session. Participants were asked to rate how satisfied they were in various aspects of their life using a 5-point Likert scale ranging from 1 ("Very Poor") to 5 ("Very Good"). Scores can range from 14 to 70, with higher scores indicating better quality of life.

The Readiness to Change survey [38] asked participants to reflect on how they felt about the ways in which they try to stay healthy. Answers were based on a 6-point Likert scale ranging from 1 ("Strongly Disagree") to 6 ("Strongly Agree"). It was conducted by the study psychiatrist during the HBT session and helped to provide insight into how willing each participant was to adopt new practices.

The Hamilton Depression Rating Scale or Ham-D [39] is the most widely used clinician-administered assessment scale that is used to assess the severity of, and change in, depressive symptoms in adults over the past week. Participant responses were based on a Likert scale and scores range from 0 to 53, with higher scores indicating greater severity of depression.

Montreal Cognitive Assessment or MoCA [40] was designed as a rapid screening instrument for mild cognitive dysfunction. It assesses multiple cognitive domains, including attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation. Scores can range from 0 to 30 where a score of 26 or greater is considered normal.

Mini-Mental State Examination or MMSE [41] is a questionnaire used to indicate the severity and progression of cognitive impairment. The questionnaire provides measures of orientation, registration (immediate memory), short-term memory (but not long-term memory), and language functioning. Scores can range from 0 to 30 where a score of 24 or greater indicates no cognitive impairment.

Both the MoCA and MMSE are used clinically in the assessment of depression, as cases of depression often have mild impairments on these two instruments.

Screening, Brief Intervention, and Referral to Treatment or SBIRT [42] was conducted by the study psychiatrist to gather details about each participant's history of alcohol and substance abuse.

The Post-HBT Patient Perception Questionnaire or PHPPQ measured the same items as the PPQ during Phase I; however, the questions were modified slightly to assess participant perception after engaging in an actual telemedicine session **(Tables 1 and 2)**. Demographic data was also collected at this time as outlined in **Table 3**. The PHPPQ aimed to document any changes in perception toward telemedicine before and after engaging in a real HBT consultation.

The Provider Questionnaire assessed the perspective of the physician who conducted the telemedicine session during Phase II of the study. Study psychiatrists were asked to rate several statements, as outlined in **Table 4**, based on a 5-point Likert scale ranging from 1 ("Disagree") to 5 ("Agree"). It was completed after each telemedicine session in order to validate the use of the Ham-D via telemedicine.

Statistical analysis

Data were initially summarized and reported by age group, race and gender. The Hamilton Depression Rating Scale was summarized by score and with the mean and standard deviation for Phase I, Phase II and for both phases combined. Analyses of the questionnaire used a Chi-squared test to compare pre- and post-phase responses for all patients and in a paired analysis looking only at patients completing both phases. All analyses used $p<0.05$ as the criterion for statistical significance. Data were analyzed using Stata 14.0 (StataCorp, College Station, TX).

Results

Quantitative analysis

Of the 41 participants that completed Phase I, 37 were initially amenable to telemedicine and expressed interest in continuing

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on to Phase II telemedicine. However, due to logistical delay in initiating Phase II, only 25 participants completed Phase II. Based on the parameters that were set forth at the beginning of the study, amenable participants were defined as those who engaged in an actual telepsychiatry session; thus, the individuals who initially agreed to continue on to Phase II, but later declined to continue were included in the non-amenable group. Specifically, 4 participants initially exited the study after completing Phase I. Eventually an additional 12 participants exited the study before completing Phase II, citing reasons that included: Moving out of state, having other conflicting social issues, and failing to respond (either due to loss of interest or outdated contact information). When analyzing the data, the 25 participants who completed Phase II were classified as amenable and the remaining 16 participants were considered non-amenable. Demographic characteristics are shown in **Table 3** and are based on those who participated in Phase II, although 2 individuals during Phase II did not complete the demographic data section and were excluded from analyses. Most participants were either African American (35.0%) or Caucasian (35.0%) with a greater male preponderance. More than half (56.0%) were ≥ 56 years of age. Demographics for Phase I were not tabulated **(Table 3)**.

As shown in **Table 2**, the mean PHQ-9 score of participants who only engaged in Phase I of the study was 8.875 ± 2.778, whereas the mean PHQ-9 score of participants who moved on to Phase II was 10.800 ± 2.217. The overall mean for all 41 participants was 10.049 ± 2.5976. In Phase II, the mean Ham-D score was 10.76 ± 5.988. A total of 7 participants had a Ham-D score of 16 or greater, consistent with the literature for a diagnosis of major depression. Based on the Ham-D scores, the majority of the patients completing the interview would be classified as dysthymic disorder or depressive disorder NOS (minor depression). PHQ-9 and Ham-D score breakdown are available upon request **(Table 5)**.

Pre- and post-session data among those who completed both phases were analyzed using paired t-tests and chi-squared tests. All tests were 2-sided and $p<0.05$ was the criterion for statistical significance. As illustrated in **Table 1** (chi-squared), 11 variables (comments #1-11) show significant p-values, indicating a significant shift in positive outlook towards telemedicine before and after the Phase II telemedicine session. Among the significant variables were: ability to talk freely over telemedicine (p=0.026), sense of privacy (p=0.015), ease with talking to a physician via telemedicine (p=0.009), quality of sound and image (p=0.001 for both), overall satisfaction with the telemedicine visit (p=0.001), preference for telemedicine over in-person consultation (p<0.001), and personal and community value of telemedicine (p=0.047). Additionally, participants were more likely to agree that the quality of medical care given through telemedicine is the same as or better than an in-person consultation after having completed an actual telemedicine session compared to before completing one (81.82% vs. 48.00%, p=0.011). **Table 3** does not include the following data: standard deviation, chi-squared value, degrees of freedom, percent breakdown for each response, and values for non-significant variables; however, these values are available upon request **(Table 1)**.

Table 2 compares responses between amenable participants (i.e., those who completed Phase I and were willing to continue the study into Phase II) and participants who were not amenable to an HBT session (i.e., those who completed Phase I only and declined to participate in Phase II of the study). Compared to amenable participants, those who were not amenable to scheduling an HBT session were more likely to be unsure about the privacy of such sessions (43.8% vs. 8.0%, p=0.011), less likely to agree about their ability to understand physician recommendations via telemedicine (50.0% vs. 64.0%, p=0.046), and less likely to strongly agree about the ease with which they could talk to a physician via telemedicine (6.30% vs. 32.0%, p=0.026). Interestingly, when participants were asked whether, if given the chance, they would theoretically engage in a telemedicine session and whether they would like to continue the study by scheduling a real telemedicine session, the former question was found to be statistically non-significant while the latter was significant (p=0.004). Furthermore, among the 16 non-amenable participants who completed only Phase I, 12 answered yes to the theoretical question of engaging in a telemedicine session; however, they ultimately declined to continue. On most items listed in **Table 2**, there were no significant differences between amenable and non-amenable participants. **Table 2** does not include the following data: Chi-squared value, degrees of freedom, percent breakdown for each response, and values for non-significant variables; however, these values are available upon request **(Table 2)**.

On **Table 4**, the physician responses following the Phase II HBT sessions are tabulated. After 25 Phase II sessions, the physicians either agreed or moderately agreed that they were satisfied with the quality of the telemedicine session, all responses agreed

Table 1: Demographic characteristics during phase II.

Variable	Frequency	Percent
Age		
≤55	10	44
56-65	13	56
Race		
Caucasian	8	35
African American	8	35
Asian	2	9
Latino/Latina	1	4
Other/Multiracial	4	17
Gender		
Female	5	22
Male	18	78
*Values are based on responses from 23 of the 25 participants from phase II		

Table 2: Patient Health Questionnaire (PHQ-9) and Hamilton Depression Rating Scale (Ham-D): Mean and Standard Deviation.

Scale	N	Mean	Standard Deviation
PHQ-9			
Phase I	16	8.875	2.778
Phase II	25	10.800	2.217
Phases I & II	41	10.049	2.5976
Ham-D			
Phase II	25	10.76	5.988

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Table 3: Patient responses regarding their perception of a telemedicine session pre/post phase II intervention.

	Comment (Pre-Questionnaire/ Post)	Strongly Agree -5	Agree -4	Undecided (3)	Disagree (2)	Strongly Disagree (1)	N/Mean Pre-Questionnaire	N/Mean Post-Questionnaire	Mean Difference POST-PRE	P-Value CHI-SQUARED
1	I would be able to talk freely over telemedicine/I felt like I could talk freely over telemedicine									
	Post Phase I	11	8	2	4	0	25/4.040	23/4.696	0.739	0.026
	Post Phase II	16	7	0	0	0				
2	I would be/was satisfied with the overall quality of care provided through telemedicine									
	Post Phase I	1	10	9	3	2	25/3.200	22/4.682	1.546	p < 0.001
	Post Phase II	15	7	0	0	0				
3	I would be/was satisfied with the mental health or substance abuse services given through telemedicine									
	Post Phase I	5	14	2	3	1	25/3.760	22/4.409	0.682	0.028
	Post Phase II	12	7	3	0	0				
4	I feel my time with the physician would be/was private									
	Post Phase I	6	9	2	5	3	25/3.400	22/4.545	1.182	0.015
	Post Phase II	15	6	0	0	1				
5	I feel like the physician would be able to thoroughly explain/thoroughly explain what was being done for my medical condition									
	Post Phase I	5	13	3	3	1	25/1.061	23/4.391	0.696	0.037
	Post Phase II	13	6	4	1	1				
6	I feel like it would be/was easy for me to talk to a physician via telemedicine equipment									
	Post Phase I	8	12	0	4	1	25/3.880	23/4.783	0.957	0.009
	Post Phase II	18	5	0	0	0				
7	I feel like the sound quality would be/was good									
	Post Phase I	3	11	7	2	2	25/3.440	23/4.609	1.174	0.001
	Post Phase II	16	6	0	1	0				
8	I feel like the image quality would be/was good									
	Post Phase I	2	13	7	2	1	25/3.520	23/4.522	1	0.001
	Post Phase II	15	6	1	1	0				
9	Overall, I would be/was satisfied with a/the telemedicine visit									
	Post Phase I	4	13	4	1	2	24/3.667	23/4.783	1.136	0.001
	Post Phase II	18	5	0	0	0				
10	I would prefer/prefer to use telemedicine instead of going to see a psychiatrist in-person									
	Post Phase I	4	2	6	9	4	25/2.720	21/4.810	2.048	p < 0.001
	Post Phase II	18	2	1	0	0				
11	Telemedicine is of value to me and my community									
	Post Phase I	6	13	5	1	0	25/3.960	22/4.545	0.546	0.047
	Post Phase II	13	8	1	0	0				

Table 4: Patient responses regarding their perception of a telemedicine session pre/post phase II intervention: phase I only vs. phase II patients.

	Comment (Pre-Questionnaire/Post)	Strongly Agree -5	Agree -4	Undecided (3)	Disagree (2)	Strongly Disagree -1	P-Value
1	I feel my time with the physician would be/was private						
	Phase I Only (non-amenable)	1	8	7	0	0	0.011
	Phase II (amenable)	6	9	2	5	3	
2	I would be able to understand/understood the recommendation(s) of the physician						
	Phase I Only (non-amenable)	5	8	3	0	0	0.046
	Phase II (amenable)	7	16	0	2	0	
3	I feel like it would be/it was easy for me to talk to a physician via telemedicine equipment						
	Phase I Only (non-amenable)	1	13	2	0	0	0.026
	Phase II (amenable)	8	12	0	4	1	

that telemedicine was of value as a care medium, and 15 of the responses (60.0%) indicated that telemedicine was of similar quality to in-person care. Eighteen physician responses (72.0%) said they would not prefer telemedicine over in-person care. When assessing ability to interpret patient behavior on items 1, 8, 9, and 10 on the Ham-D, 18 responses (72.0%) indicated that the image was essentially the same as an in-person encounter when assessing depressed mood (item 1), 15 responses (60.0%) marked the same answer when assessing psychomotor retardation (item 8), 14 response (56.0%) selected this when assessing agitation

Table 5: Provider questionnaire responses post-intervention during phase II.

	Question	Agree	Moderately Agree	Neutral	Moderately Disagree	Disagree	Better than in Person	Same as in Person	Not as Good as in Person	Image did not allow adequate observation to interpret behavior	Image significantly affected my ability to interpret behavior	Image slightly affected my ability to interpret behavior	Image was not as good as in-person encounter, but did not affect my ability to interpret behavior	Image was essentially indistinguishable from in-person encounter
	Overall, I was satisfied with the telemedicine visit													
1	Frequency	14	9	1	1	0	-	-	-	-	-	-	-	-
	N/Percent	25/56%	25/36%	25/4%	25/4%	25/0%	-	-	-	-	-	-	-	-
	I would prefer to use telemedicine to treat patients instead of seeing the patient in-person													
2	Frequency	2	1	4	15	3	-	-	-	-	-	-	-	-
	N/Percent	25/8%	25/4%	25/16%	25/60%	25/12%	-	-	-	-	-	-	-	-
	Telemedicine is of value to me and my community													
3	Frequency	25	0	0	0	0	-	-	-	-	-	-	-	-
	N/Percent	25/100%	25/0%	25/0%	25/0%	25/0%	-	-	-	-	-	-	-	-
	I think the quality of medical care given through telemedicine is…													
4	Frequency	-	-	-	-	-	1	15	9	-	-	-	-	-
	N/Percent	-	-	-	-	-	25/4%	25/60%	25/36%	-	-	-	-	-
	Q1: Depressed mood													
5	Frequency	-	-	-	-	-	-	-	-	0	0	0	7	18
	N/Percent	-	-	-	-	-	-	-	-	25/0.00%	25/0.00%	25/0.00%	25/25.00%	25/72.00%
	Q8: Retardation													
6	Frequency	-	-	-	-	-	-	-	-	0	0	2	8	15
	N/Percent	-	-	-	-	-	-	-	-	25/0.00%	25/0.00%	25/8.00%	25/32.00%	25/60.00%
	Q9: Agitation													
7	Frequency	-	-	-	-	-	-	-	-	0	0	0	11	14
	N/Percent	-	-	-	-	-	-	-	-	25/0.00%	25/0.00%	25/0.00%	25/44.00%	25/56.00%
	Q10: Anxiety Psychic													
8	Frequency	-	-	-	-	-	-	-	-	0	0	0	8	17
	N/Percent	-	-	-	-	-	-	-	-	25/0.00%	25/0.00%	25/0.00%	25/32.00%	25/68.00%

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(item 9), and 17 responses (68.0%) marked this when assessing anxiety (item 10). There were no physician responses reporting that the image significantly impacted ability to interpret behavior for any of these items **(Table 4)**.

Qualitative observations

The majority of patients who participated in the study were low-income and living in public or subsidized housing in San Francisco. Out of the 25 participants who engaged in Phase II, 15 chose to hold their HBT session at their home while the remaining 10 opted to hold the session at 360. Although telemedicine enables participants to receive care from the convenience of their home, we offered the clinic as an alternate, private location in case participants preferred to hold their session elsewhere. Participants that chose to have their session at the clinic still engaged in a telepsychiatric interview using UCSF-issued devices; however, the physicians conducted the sessions from outside the clinic to maintain consistency with the delivery of treatment. Reasons for holding the telemedicine session at the clinic included issues with housing, such as difficulties with housing management or lack of adequate space, and personal preference. Several participants were uncomfortable with allowing research members into their home to set up the telecommunication equipment, sometimes citing uneasiness with strangers or embarrassment about the condition of their living space.

Those who opted for an HBT session at home were welcoming to the research members. Although many cleaned their homes in anticipation for the visit, the research members were faced with a variety of home scenarios: One participant answered the door in undergarments; another had smoking paraphernalia exposed on his coffee table; a third participant's home was thick with cigarette smoke, making it difficult to breathe. Fortunately, no mental health crisis arose during the study. However, having two research members was optimal as it allowed one member to set up equipment while the other engaged with the patient. This dynamic proved useful especially at times when it took up to 45 min of troubleshooting to establish connection via Jabber.

Discussion

Principal results

The early results from this study have affirmed the feasibility of using telemedicine as a viable alternative to normal standard of care for HIV-positive patients over the age of 50 with mild-moderate depressive symptoms in an urban setting. Despite limitations in sample size, this study offers insight into the feasibility of telepsychiatry, demonstrating statistically significant changes in perception favoring telepsychiatry. Showing feasibility, even in a small group, is the first step leading to a larger study in a broader group of patients. The benefit of using 2-way video in the delivery of psychiatric care is that the physician is able to analyze the nuances of patient communication to a greater extent, such as having the ability to view facial expressions and body language.

The completion of standardized clinical psychometric measures (including the Ham-D, MoCA, and MMSE) through the medium of telemedicine was supported by this study. The MoCA and MMSE were included as part of the overall psychiatric evaluation; however, the study did not specifically measure the clinicians' views on administering these assessments as was done for the Ham-D. Clinician rating of the reliability of these instruments via telemedicine was sufficient such that these results can be considered reliable. This will become important when longitudinal studies are conducted through telemedicine for detailed analysis of outcomes in mood disorders.

Relatively few patients had a Ham-D score >16, despite the screening PHQ-9. This suggests that the PHQ-9 range chosen under-called MDD, suggesting either a placebo response to the telemedicine encounter or patients over-endorsing symptoms on the PHQ-9.

The results from this study, especially those that were found in the pre- and post-session questionnaire comparison, suggested significant improvement of the perception towards telemedicine after the HBT session by this patient population. In one case, a participant who had openly expressed skepticism pre-session commented that, "If I had a hat, I would eat it" upon completion of his HBT session.

This study demonstrated that telemedicine can be an accepted medium for psychiatric care in the PLWH population. There may be patients who are reluctant to attend a psychiatric clinic (for fear of "stigma" for seeking psychiatric treatment) and even resist seeking care from a psychiatrist in an embedded care model within HIV care models. In addition, psychiatric symptoms/illness may make patients more reticent to leave home to seek any clinical care.

Although preference for holding the telemedicine session at the clinic may have posed additional inconveniences for participants in this study, current technology allows patients to download and utilize free software, eliminating any discomfort associated with welcoming individuals into the privacy of one's home. Young et al. found that most barriers to adopting home-based health information technology for older adults fell into one of four categories: technological discomfort, privacy or security concerns, lack of relative advantage, and the undesirable perception of users of such systems. In order to alleviate these challenges, telemedicine systems can incorporate familiar computer applications, address privacy and security concerns, and align with older adults' self-image and identity [43]. For those willing to have psychiatric care conducted via telemedicine while remaining at home and who have the appropriate technology available, this model may represent a viable alternative.

The current study extends prior work on telemedicine for the care of depression in rural and correctional settings by studying a particular demographic in an urban area. As many urban dwelling patients still face barriers to obtaining in-person clinical services (e.g. transportation barriers, physical or financial limitations, difficulty navigating in-person systems of care), the potential demand for telemedicine services in an urban area may prove to be significant. This study is also the first to specifically analyze depression in older HIV+adults, a group often considered to be underserved in models of care. The use of telemedicine for the care of depressive disorders in this population may prove to be a viable policy option for urban care systems serving HIV patients.

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Future studies may be considered to generalize the conclusions of this study beyond the assessment of depressive disorders in PLWH. Many PLWH may experience trauma and stressor-related disorders, anxiety disorders, neurocognitive disorders, bipolar disorders, and psychotic disorders. Application of this clinical paradigm of telemedicine to these other psychiatric illness groups would be the logical next step in developing a more comprehensive range of psychiatric services by telemedicine.

The broader issue of providing home-based telemedicine service is a compelling one. Issues of computer access, privacy/security concerns, and the logistics of having a clinical team going on-site to provide a secure computer system to complete telemedicine interviews would need to be addressed from a legal, logistical, and regulatory point of view before such a model could become a more routine method of clinical service. Issues pertaining to costs of supporting telemedicine as a routine clinical intervention would also need to be addressed in a systematic way before this delivery of care could be generalized to routine models of care in non-research settings.

Conclusion

Given the high prevalence of depressive disorders in older PLWH, alternative care models may be developed to deliver high quality and patient-centered care in the context of overall medical interventions. HBT for the assessment of depressive disorders in older PLWH in an urban setting shows significant promise as an alternative care delivery model for the comprehensive psychiatric and systemic medical care for this patient group.

Limitations

Limitations of the study include a focus on a specific systemic illness and psychiatric illness co-morbidity in an older population in an urban setting. It may be that in rural settings, where there is limited local access to in-person psychiatric services, there may be a greater acceptance of telemedicine than in an urban setting, where such services may be at least physically proximate. A comparison study of the same patient demographic in a rural setting could address this issue. It may also be that HIV patients with mood disorders experience “double stigma” associated with having two illnesses, which may affect their acceptance of novel medical interventions in ways that need further elucidation. Other limitations include small sample size and the use of multiple forms of technology, including email, phone, and laptop, which may have influenced overall patient satisfaction or perception.

Author Contributions

1. Jessica Y Rhee: Research design, study recruitment, data collection, overall project coordinator, critical revision of manuscript.
2. Eric J Chan: Clinical interviews, critical revision of manuscript.
3. Paul M Elizondo III: Clinical interviews, critical revision of manuscript.
4. James A Bourgeois: Research design, clinical interviews, critical revision of manuscript.
5. Cameron W Foreman: Study equipment preparation, critical revision of manuscript.
6. Lisa Dazols: Study equipment preparation, critical revision of manuscript.
7. Jorien G Breur: Clinical interviews, critical revision of manuscript.
8. Joseph K Shemuel: Study equipment preparation, critical revision of manuscript.
9. Amanda R Martin: Study equipment preparation, critical revision of manuscript.
10. Sharonya Shrivastava: Study equipment preparation, critical revision of manuscript
11. Isabel E Allen: Data analysis and interpretation, critical revision of manuscript.
12. Malcolm D John: Research design, critical revision of manuscript.

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Using Telemedicine to Combat the Opioid Epidemic

By: Adm. Brett P. Giroir, M.D., Assistant Secretary for Health, U.S. Department of Health and Human Services |
Published: September 20, 2018

Topics

HHS Opioid

Cross-posted *from Health IT Buzz*

Adm. Brett P. Giroir, M.D., Assistant Secretary for Health

Editorial Note: Among the hidden casualties of the nation's opioid epidemic are outbreaks of HIV and HCV infections among people who inject drugs. Making medication-assisted substance abuse treatment more widely accessible can help people recover from substance use disorder as well as reduce the risk of HIV transmission among injection drug users.

Combatting the opioid crisis is a top priority for the Trump Administration and the U.S. Department of Health and Human Services (HHS). We are making progress. Just last week we released the 2017 National Survey on Drug Use and Health (NSDUH) data, which showed significantly more people received treatment for substance use disorder in 2017 than in 2016; this was especially true for those with heroin-related opioid use disorders. In addition, the number of people who initiated use of heroin in 2017 was less than half of the number in 2016.

While these are promising data, we know there is still much more work to be done, especially in rural areas that have been hard hit by the opioid epidemic. This is particularly true in some rural and remote areas of the country where patients with opioid use disorder (OUD must travel long distances to receive treatment; and there are too few clinicians available to provide medication-assisted treatment (MAT)—an essential component in the treatment of OUD.

HHS is committed to improving access to MAT for OUD and is working on a variety of strategies to improve access to this life saving treatment through increased funding to states and communities, payment policy changes, and education, training and technical assistance. One such area is to help providers understand how telemedicine can be used, in certain circumstances, to expand access to buprenorphine-based MAT.

Working with the Drug Enforcement Administration (DEA), HHS developed materials to help clarify how clinicians can use telemedicine as a tool to expand buprenorphine-based MAT for opioid use disorder treatment under current DEA regulations. The information, including a clinical practice example that is consistent with applicable DEA and HHS administered authorities, can help to increase access to buprenorphine by utilizing telemedicine to expand provider's ability to prescribe MAT to patients, including remote patients under certain circumstances. This especially will support access to buprenorphine in rural areas where there may be a smaller number of providers with a DATA 2000 waiver—which allows qualified practitioners to prescribe buprenorphine for the treatment of OUD in settings other than a federally regulated opioid treatment program.

Sadly, this information is not widely known among healthcare providers and other stakeholders; and many have been reluctant to utilize telemedicine for prescribing MAT. That is why we are taking this opportunity during Prescription Opioid and Heroin Epidemic Awareness Week (September 16-22, 2018) to make sure everyone knows that effective treatment is available, including via telemedicine, to help combat the opioid epidemic in the U.S. Beyond telemedicine, health information technology (health IT) can be leveraged in many ways to combat the nation's opioid crisis. The Office of the National Coordinator for Health IT (ONC) has resources for healthcare providers to learn more about health IT tools to combat the opioid epidemic through the Opioid Epidemic and Health IT chapter in the Health IT Playbook and ONC's Educational Module for Behavioral Health Providers [PDF, 5.1MB].

Please share this information with your colleagues and networks as we are hopeful that we can help eliminate this perceived barrier to treatment.

Telehealth May Improve HIV Viral Suppression for People in Prison

By Sony Salzman

Of the 2.2 million people incarcerated in prisons and jails across the U.S., about 1.5% are living with HIV, meaning HIV is about four times more prevalent in prison than in the general population.

Delivering high-quality health care to people in prison living with HIV is difficult because of the lack of privacy and the strong HIV stigma in prison. Another major hurdle is funding, with some cash-strapped states choosing not to prioritize specialty HIV care.

The end result is that HIV in prison is a major problem. This correlation was no surprise to nurses gathered at a presentation given by pharmacist Melissa Badowski, Pharm.D., BCPS, AAHIVP, a clinical associate professor at the University of Illinois in Chicago, at the annual conference of the Association of Nurses in AIDS Care (ANAC 2018) in Denver.

With a show of hands, the majority of nurses packed into Badowski's crowded session said they've cared for currently or formerly incarcerated HIV-positive patients. These nurses were looking for new strategies to tackle a decades-old problem.

According to Badowski, those new strategies should include telehealth -- the idea of using Skype-like video consultations and remote diagnostics to deliver high-quality health care. Telehealth originally took off as a way to reach patients living in rural areas. Because telehealth is fully remote, transportation costs are slashed to near-zero.

The Illinois Department of Corrections implemented a telehealth program for incarcerated people living with HIV in 2010. Illinois has the sixth highest number of people living with HIV in its correctional setting -- after Florida, Texas, New York, California, and Georgia.

As part of its new telehealth services, incarcerated patients sit alongside nurses based in-house within the correctional facility and connect via video conference to a team of care providers, including Badowski, a pharmacist, an infectious disease physician, and a case manager.

To determine if the telehealth program was, in fact, improving outcomes, Badowski and her colleagues compared viral suppression rates before and after the program was implemented.

The 'before' comparison group was comprised of 514 incarcerated people whose HIV had been managed by the regular on-site physician from July 2009 to June 2010. The 'after' group was made up of 687 incarcerated people who received telehealth services from July 2010 to June 2012.

At baseline, the CD4 counts for these groups were essentially the same (485.4 cells/μL and 502.9 cells/μL, respectively). After six visits, the telemedicine group had an average virologic suppression rate of 91.1%, while the 'before' group who didn't have access to telemedicine had an average virologic suppression rate of only 59.3%.

The positive effect of telemedicine remained even when researchers removed all the patients who had already been suppressed at their first visit from their analysis (75.8% and 23.0%, respectively). The telemedicine group also had better viral suppression rates regardless of their baseline CD4 count. Badowski and her colleagues published their results in 2014 in *Clinical Infectious Diseases*.

Badowski is calling Illinois' HIV telehealth program a success. She says similar telehealth programs are taking off in other states, such as California and Texas.

While she's not aware of any data demonstrating its cost-effectiveness, Badowski says telehealth is the most affordable way to deliver high-quality HIV care for budget-conscious states.

"We are increasing viral suppression, [and] this has been able to provide some cost savings from the transportations security standpoint," she said. "I think a lot of prisons are looking at doing a telehealth model, because it just provides wonderful care and wonderful access to inmates."

"I don't know why it isn't in more states," she said.

Nationwide, deaths from AIDS have plummeted in prisons since the 1990s, mirroring the decline in AIDS-related deaths in the general population thanks to highly effective antiretrovirals.

For Badowski, the next major hurdle is ensuring that incarcerated people are set up to succeed outside of prison. Too often, people in prison living with HIV see their health plunge when they're released. If they violate parole or commit another crime, they often return to prison with higher viral loads than when they left.

There's certainly a big role to play for case managers, who can help prepare people in prison for the logistics of navigating the parole system and finding stable employment and housing once released.

But ultimately, Badowski says the answer may lie in technology. Specifically, she pointed to a 2017 study on cell phones and recently released, HIV-positive inmates led by HIV researcher David Wohl, M.D., at the University of North Carolina at Chapel Hill.

For that study, Wohl and his colleagues wanted to see which patients would do better -- those who were released with a cell phone, and those who were released with a cell phone plus a comprehensive engagement program to help them maintain viral suppression.

As it turns out, the group of study participants who received a cell phone plus extra services only did slightly better than those who received just a cell phone. That led Badowski to conclude that the most crucial aspect of the study is the cell phone itself. That alone was enough to help people living with HIV do well post-release, regardless of the other interventions.

For Badowski, this research indicates that formerly incarcerated people are relatively adept at navigating complex systems and staying healthy after release -- provided there's an easy way for them to contact their doctors and parole officers, and an easy way to be contacted directly themselves.

Sony Salzman is a freelance journalist reporting on health care and medicine, who has won awards in both narrative writing and radio journalism. Follow Salzman on Twitter: @sonysalz.

UCSF 360

Urban HIV Telemedicine Program

Face-to-face videoconferencing brings HIV specialty services to patients throughout San Francisco.

Face-to-face videoconferencing brings HIV specialty services—such as pharmacy and nutrition consultation—to patients throughout the San Francisco Bay Area.

About the program

The Urban HIV Telemedicine Program (UHTP) began in 2010 when UCSF partnered with neighborhood health centers to provide their patients—often from the most marginalized and underserved communities—with top-quality HIV specialty care and services.

Many patients have social, health, financial, transportation, or time issues that prevent them from seeking specialist care. Through real-time, confidential videoconferencing with UCSF 360 providers, patients can receive expert HIV care, nutrition counseling, pharmacy information, mental health care, and other specialty services from their local clinic or from home using a phone, computer, or tablet and a free app.

How UHTP is working for our patients

Community clinics in San Francisco connect their patients to UCSF 360 providers through UHTP

Proportion of patients in the UHTP study who indicated that they would prefer a telemedicine appointment for thier next visit

Number of patients who accessed top-quality psychiatry and therapy services from the comfort of their own homes through our telepsychiatry study

What Happens During a UHTP Consultation

In a UHTP consultation, the patient and provider see and speak to each other through a two-way videoconferencing system. Just like in the doctor's office, a UHTP consultation between a patient and a UCSF 360 provider is completely confidential and patients can speak freely about their symptoms and wellness goals.

Services

— HIV primary care
— HIV consult services
— Nutrition counseling
— Pharmacist services
— Mental health services