Mobile Phone Technology: A New Paradigm for the Prevention, Treatment, and Research of the Non-sheltered “Street” Homeless?

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ABSTRACT *Individuals experiencing homelessness have disproportionately high rates of health problems. Those who perceive themselves as having greater access to their social support networks have better physical and mental health outcomes as well as lower rates of victimization. Mobile phones offer a connection to others without the physical constraints of landlines and, therefore, may make communication (e.g., access to one’s social support networks) more feasible for homeless individuals. This, in turn, could lead toward better health outcomes. This exploratory study examined mobile phone possession and use among a sample of 100 homeless men and women who do not use the shelter system in Philadelphia, PA. Interviews were comprised of the Homeless Supplement to the Diagnostic Interview Schedule, a technology module created for this investigation, and the substance use and psychiatric sections of the Addiction Severity Index. Almost half (44%) of the sample had a mobile phone. In the past 30 days, 100% of those with mobile phones placed or received a call, over half (61%) sent or received a text message, and one fifth (20%) accessed the Internet via their mobile phone. Participants possessed and used mobile phones to increase their sense of safety, responsibility (employment, stable housing, personal business, and sobriety or “clean time”), and social connectedness. Mobile phones could potentially be used by public health/health care providers to disseminate information to the street homeless, to enhance communication between the street homeless and providers, and to increase access for the street homeless to prevention, intervention, and aftercare services. Finally, this technology could also be used by researchers to collect data with this transient population.*

KEYWORDS *Homeless, Technology, Cell phone, Mobile phone, Social support, Prevention, Treatment, Intervention, Aftercare, Methods*

BACKGROUND

Individuals experiencing homelessness have disproportionately high rates of health problems, including obesity, hypertension, diabetes, heart disease, pulmonary illness, substance use disorders, and mental illness.^{1–4} Recent evidence indicates that homeless individuals who perceive themselves as having greater access to their

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social support networks have better physical and mental health outcomes as well as lower rates of victimization.⁵ Contacting friends, family members, and health care providers can be difficult for the homeless who generally have limited access to telephone landlines, no permanent mailing address, little money for pay phones and public transportation, and in some cases, difficulty walking long distances because of physical ailments and safety concerns.

In the general population, people are increasingly relying on mobile phones to maintain contact with others, both personally and professionally.⁶ The latest statistics from a 2007–2008 US survey on voice communication indicate that 89% of the population have a mobile phone, 79% have a landline, and 15% have an Internet connection they can use for phone calls.⁶ Only 9% of the population use a landline exclusively, whereas 15% use a mobile phone exclusively. In general, few demographic differences exist between those who rely exclusively on mobile phones for their telephonic voice communication and those who do not. However, the data show that a slightly higher percentage of males, individuals under 50 years of age, and individuals with less formal education rely exclusively on their mobile phones. The most striking demographic difference occurs with race: 78% percent of whites, 15% of Latinos, and 7% of African Americans report mobile phone only use. No pattern was detected between income groups.

People in the general population are also using their mobile phones progressively more to communicate with others via short message service—or text messaging. In 2008, the average monthly number of text messages outnumbered the average monthly number of phone calls (357 and 204 per month, respectively).⁷ Additional studies have found that younger people (between the ages of 18 and 29 years) are more likely than older people to text message regularly and that 42% of Latinos, 34% of African Americans, and 28% of whites send or receive a text message on an average day.⁸ Data delineating text messaging by sex, education, and income could not be located.

Mobile phones offer a connection to others without the physical constraints of landlines and may make communication and, therefore, access to one's social support network more feasible for homeless individuals. This, in turn, could lead toward better health outcomes. Demographic data show that homeless individuals are more likely to be male, middle-aged (between 31 and 50 years of age), less educated (usually high-school degree or general equivalency diploma [GED]), and of color (particularly African American).^{9,10} As aforementioned, in the general population, these same variables distinguish those who rely heavily on their mobile phones for voice and text communication from those who do not. This study endeavors to elucidate the mobile phone possession and use of the homeless. Such information could inform public health practice (e.g., increasing communication among transient clients, their loved ones, and their health care providers), public–private partnerships (e.g., community collaborations with mobile phone service providers), and research methodologies (e.g., mobile phone use for data collection and intervention delivery).

Only one published article on homeless mobile phone use was detected in a review of the scientific literature. Freedman and colleagues¹¹ conducted a pilot test in Birmingham, AL, to determine whether 30 homeless crack cocaine users in treatment would use mobile phones to complete surveys at eight randomly selected times each day to report real-time cocaine craving and use. Eighty-six percent of subjects completed the 2-week protocol. Subjects completed the surveys an average of five times per day, and almost three-quarters of the toxicology results matched with the subject's self-report of use.

The study of Freedman et al¹¹ represents an important start, but clearly, many questions loom about the mobile phone use of homeless individuals. For instance, has the homeless population already entered the mobile phone market? For what purposes do they use their mobile phones? And, finally, does mobile phone use provide greater access to social support networks? The purpose of this study was to begin to answer these important questions. Specifically, this study examines, quantitatively and qualitatively, the mobile phone use of 100 “street” homeless in Philadelphia, PA.

METHODS

The study was approved by Temple University’s Institutional Review Board in March 2009.

Sample Recruitment

A convenience sample of homeless people who do not use the shelter system ($N=100$) was recruited between March and July 2009 in Philadelphia. A local homeless services provider introduced the principal investigator to five homeless individuals who had been living on the streets for several years. These individuals were scheduled for interviews. Because this study’s primary purpose was to examine social support, a snowball sampling method was used to recruit the remainder of the sample. At completion of the interview, participants were given \$25 for their time as well as five “friend referral cards.”¹² Participants were asked to distribute these cards to others whom they knew slept overnight on the streets or visited drop-in cafés. Potential participants were able to call, e-mail, or stop by during interviewing hours to be screened for study eligibility and to schedule an interview. If one of the participant’s “friends” completed an interview and returned the “friend referral card,” the referrer was given \$10.

Prior to scheduling an interview, each potential participant was screened to determine study eligibility (Figure 1). Potential participants were told the study focused on “people who do not have a regular place to stay” and then asked where they slept overnight for each of the past 14 nights. If the interviewer considered the potential participant’s responses dubious, additional questions were asked to ascertain veracity, such as “where do you eat,” “where do you keep your personal belongings,” “where do you get your mail,” and “where do you shower?”

After screening, men and women were determined to be eligible for the study if they met two criteria: (1) they were 18 years or older and (2) they stayed overnight either on the streets (e.g., in parks, in subway stations, under bridges) or in one of the city’s three drop-in cafés for at least eight out of the past 14 nights. To ensure adequate representation of women in the sample, only women were recruited during the last 6 weeks of the study. The city’s drop-in cafés are reserved for homeless people who have been banned from city shelters or for some other reason are unable to negotiate the city shelter system (e.g., have severe, untreated psychotic symptoms, are vehemently distrustful of all people, or are deemed exceptionally difficult to engage). The cafés differ from shelters insofar as they have no beds. They serve only as a safe place for this population to go between the hours of 10 PM and 8 AM.

After complete description of the study to the eligible participants, written informed consent was obtained. The principal investigator interviewed 74 participants, and two graduate-level research assistants interviewed 26 participants. Interviews were conducted primarily in a single café in the downtown area because it was convenient for

FIGURE 1. Flowchart of participant screening process.

participants. Four interviews were conducted in the principal investigator's office because of participant scheduling conflicts.

Measures

Interviews, using a mixture of qualitative and quantitative methods, ran from 1 to 4 h in length and were audio-taped. As detailed and as complete as possible, a history of housing, shelter use, and homelessness was collected using an open-ended format. The Homeless Supplement to the Diagnostic Interview Schedule (DIS/HS) was completed as a "check" on the information gathered during the open-ended residential history questions. The DIS/HS is a structured interview, collecting data on the longitudinal course of homelessness, precipitants of homelessness, shelter use history, transience, and recent residential history.¹³ Technology use information was gathered with an instrument created for this investigation. Data collected during this interview segment included whether participants have a mobile phone, how and with whom they communicate using their mobile phone, and the general content of their communications. The alcohol/drug use and psychiatric sections of the Addiction Severity Index (ASI)—a structured interview that assesses problem

severity in a client's life—were completed.¹⁴ Finally, a series of demographic questions were asked to conclude the interview.

Both the DIS/HS and the ASI have been shown to yield reliable and valid data.^{13,15,16} The psychometric properties of the technology use module have not been examined. This investigation relies primarily on data yielded from the technology use module, supplemented with the addition of descriptive characteristics from the DIS/HS, the ASI, and the demographic module.

Data Analysis

Quantitative data analyses were conducted using SPSS 18.0. Descriptive statistics included percentage rates for categorical variables and means, standard deviations, medians, and modes for continuous variables. The principal investigator examined relationships of mobile phone possession and use with demographic (sex, age, race/ethnicity, education, employment, income, marital/relationship status, and veteran status), homeless (sleeping place, homeless age-of-onset, number of homeless episodes, lifetime years homeless, and self-perception of homelessness), substance use (alcohol and drug use, ASI composite scores, and prior treatment episodes), and mental health (possible mental health problems, ASI composite score, and prior treatment episodes) variables. These analyses were conducted using χ^2 and Fisher's exact tests as well as binary logistic regression equations.

Qualitative data analysis was conducted using an inductive approach.^{17,18} Data were transcribed, and the principal investigator read through the entirety of participant responses to acquire an overall sense of the data, noting recurring themes. She then created a set of categories based on the recurring themes. The principal investigator placed each distinct quote into one of the created categories. Quotes were selected to illustrate the data coded into each of the created categories.

RESULTS

The sample was predominantly male (73%), middle-aged (45.00 ± 10.02 years of age), of color (89%), and non-Hispanic (95%; Table 1). Over half (63%) had a high-school degree or a general equivalency diploma. Although 65% of the sample was unemployed, 84% reported income in the past month. Income originated from odd jobs (21%), disability benefits (13%), food stamps (10%), welfare (18%), panhandling (7%), temp agency work (1%), trading sex (1%), other sources (5%), and a combination of these sources (19%). Twelve percent were veterans.

Almost two thirds (63%) of participants spent the past 14 nights exclusively on the streets, approximately one fifth (19%) exclusively in cafés, 11% a combination of streets and cafés, and 7% also included brief stays in hospitals and with loved ones (Table 1). When asked why they were currently homeless, primary reasons included job loss and difficulty finding employment (24%), having no income (17%), substance abuse problems (14%), inability to afford housing/move-in costs (first and last months' rent plus security deposit; 12%), lack of action on their part (6%), mental health problems (4%), physical health problems (4%), and ending romantic relationships (4%). Two percent of participants were on waiting lists for public housing, and 2% reported enjoying the freedom of the streets. Total lifetime years homeless ranged from 3 months (0.25 years) to 46.50 years, with a mean of 11.69 years ($SD=8.86$). Only 4% had been homeless for less than 1 year over the course of their lives and only 15% for less than 3 years. An overwhelming majority (94%) considered themselves to be "homeless."

TABLE 1 Demographic and homeless characteristics

	Participants with mobile phone (<i>n</i> = 44)	Participants without mobile phone (<i>n</i> = 56)	Total sample (<i>N</i> = 100)
Female (% [n])	23 (10)	30 (17)	27 (27)
Age (mean ± SD)	44.12 ± 10.45 ^a	45.68 ± 9.73	45.00 ± 10.02
Race ^b (% [n])			
African American	67 (29)	86 (47)	78 (76)
White	14 (6)	11 (6)	11 (12)
Multiracial	12 (5)	2 (1)	6 (6)
Native American/American Indian	5 (2)	2 (1)	3 (3)
Other	2 (1)	0 (0)	1 (1)
Hispanic/Latino	7 (3)	4 (2) ^a	5 (5)
Religious affiliation (% [n])			
Christian	64 (28)	75 (42)	70 (70)
Muslim	9 (4)	5 (3)	7 (7)
Jewish	5 (2)	0 (0)	2 (2)
Other	23 (10)	20 (11)	21 (21)
High-school diploma/general equivalency diploma ^c	79 (33)	51 (28)	63 (61)**
With special skills/training	30 (13)	48 (27)	40 (40)
Current employment ^c			
Not employed	57 (24)	71 (39)	65 (63)
Odd jobs	38 (16)	29 (16)	33 (32)
Regular part-time	5 (2)	0 (0)	2 (2)
Full-time	0 (0)	0 (0)	0 (0)
Current income			
With any income (% [n])	86 (38)	82 (46)	84 (84)
For those with income, mean ± SD income in past 30 days	\$514.17 ± \$437.48	\$420.14 ± \$434.16	\$462.68 ± \$435.58
Current marital status (% [n])			
Never married	50 (22)	66 (37)	59 (59)
Divorced	23 (10)	16 (9)	19 (19)
Married/partnered	18 (8)	2 (1)	9 (9)
Separated	5 (2)	9 (5)	7 (7)
Widowed	2 (1)	5 (3)	4 (4)
Remarried	2 (1)	2 (1)	2 (2)
Veteran	11 (5)	13 (7)	12 (12)
In the past 14 nights (% [n])			
Sleeping on the streets	59 (26)	66 (37)	63 (63)
Visiting in a café	18 (8)	20 (11)	19 (19)
Staying in a combination of streets and café	11 (5)	11 (6)	11 (11)
In other arrangements ^d (% [n])	11 (5)	4 (2)	7 (7)
Age of first homeless episode (mean ± SD)	31.73 ± 12.44	28.82 ± 10.91	30.10 ± 11.64
Episodes of homelessness			
With >1 episode (% [n])	55 (24)	50 (28)	52 (52)
No. of times lived in own place for ≥1 month since first time homeless for those with >1 episode (mean ± SD)	2.88 ± 2.66	2.36 ± 1.79	2.60 ± 2.23

TABLE 1 (continued)

	Participants with mobile phone (<i>n</i> = 44)	Participants without mobile phone (<i>n</i> = 56)	Total sample (<i>N</i> = 100)
Lifetime years homeless (mean ± SD)	8.45 ± 6.77	14.23 ± 9.52	11.69 ± 8.86***
Lifetime years homeless (% [<i>n</i>])			
<1 year	5 (2)	4 (2)	4 (4)
<3 years	18 (8)	13 (7)	15 (15)
<5 years	36 (16)	16 (9)	25 (25)*
<10 years	66 (29)	34 (19)	48 (48)***
<15 years	82 (36)	52 (29)	65 (65)**
<20 years	91 (40)	70 (39)	79 (79)
<25 years	98 (43)	89 (50)	93 (93)
Consider themselves to be homeless (% [<i>n</i>])	98 (43)	91 (50) ^a	94 (93)

p* ≤ .05, *p* ≤ .01, ****p* ≤ .001
^aOne participant declined to answer this question
^bTwo participants defined themselves only as Latino (one mobile phone user and one mobile phone nonuser)
^cThis question was omitted from three of the first interviews (two mobile phone users and one mobile phone nonuser)
^dOther arrangements include a combination of staying on the streets and in cafés with exceptionally brief stays in hospitals and with acquaintances/friends/relatives. All participants spent at least 8 out of the past 14 nights either on the streets or in cafés

Approximately three quarters (76%) of participants used alcohol or other drugs in the past 30 days. Over half (62%) reported at least one episode of substance abuse treatment. The most-used substances were alcohol (68%), cannabis (38%), and cocaine (30%; Table 2). Furthermore, over half (63%) of the sample experienced possible mental health problems in the past 30 days. Approximately half (51%) reported at least one episode of mental health treatment. The most-endorsed mental health problems were feelings of serious depression (46%); considerable difficulty understanding, concentrating, or remembering things (35%); and serious anxiety or tension (32%). Despite the high rate of mental health problems, only one quarter (24%) of the sample was prescribed psychotropic medication in the past 30 days. Half (50%) of participants both used substances and experienced possible mental health problems. Only 10% were negative for both assessments.

Mobile Telephone Use

Almost half (44%) the sample had mobile phones. Participants owned (*n* = 35, 80%), borrowed long-term (*n* = 8, 18%), and rented (*n* = 1, 2%) their phones. Over half of these participants (*n* = 23, 52%) had month-to-month plans, almost one third (*n* = 13, 30%) had prepaid plans, 14% (*n* = 6) had contract plans, 2% (*n* = 1) had other phone arrangements, and 2% (*n* = 1) were unsure. One participant explained that he and his “buddies” purchased a family plan, and they split the bill each month. Metro (*n* = 14, 32%), Cricket (*n* = 11, 25%), and T-Mobile (*n* = 7, 16%) were the most used companies. Respondents’ plans cost anywhere from \$10 to \$100 per month, with a mean of \$43.50 (SD = 16.86).

Participants with month-to-month or contract plans (*n* = 29) received their mobile phone bills in a variety of ways: mailed to a relative or friend’s home (*n* = 8, 27%),

TABLE 2 Substance use and mental health characteristics

	Participants with mobile phone (<i>n</i> =44)	Participants without mobile phone (<i>n</i> =56)	Total sample (<i>N</i> =100)
Used alcohol in past 30 days (% [n])	73 (32)	61 (34)	66 (66)
Alcohol use composite score			
Score > 0 (% [n])	73 (32)	64 (36)	68 (68)
For those >0 (mean±SD)	0.25±0.22	0.27±0.18	0.26±0.20
Drug use in past 30 days (% [n])			
Used cannabis	48 (21)	30 (17)	38 (38)
Used cocaine	25 (11)	34 (19)	30 (30)
Used opioids (nonheroin)	5 (2)	4 (2)	4 (4)
Used heroin	2 (1)	2 (1)	2 (2)
Used methadone	2 (1)	2 (1)	2 (2)
Used sedatives	0 (0)	4 (2)	2 (2)
Used barbiturates	5 (2)	0 (0)	2 (2)
Used any drug	59 (26)	43 (24)	50 (50)
Drug use composite score			
Score>0 (% [n])	57 (25)	43 (24)	49 (49)
For those >0 (mean±SD)	0.24±0.28	0.43±0.41	0.33±0.36
Prior substance abuse treatment episodes			
With >0 alcohol treatments (% [n])	34 (15)	43 (24)	39 (39)
No. of alcohol treatments for those >0 (mean±SD)	3.13±4.81	4.92±6.73	4.23±6.06
With >0 drug treatments (% [n])	48 (21)	52 (29)	50 (50)
No. of drug treatments for those >0 (mean±SD)	5.05±6.30	7.00±7.80	6.18±7.20
Possible mental health problems in past 30 days ^a			
Serious depression (% [n])	45 (20)	45 (25)	45 (45)
Trouble understanding, concentrating, or remembering (% [n])	34 (15)	36 (20)	35 (35)
Serious anxiety or tension (% [n])	36 (16)	29 (16)	32 (32)
Trouble controlling violent behavior (% [n])	14 (6)	16 (9)	15 (15)
Serious thoughts of suicide (% [n])	7 (3)	9 (5)	8 (8)
Hallucinations (% [n])	5 (2)	11 (6)	8 (8)
Suicide attempts (% [n])	0 (0)	2 (1)	1 (1)
Any possible mental health problem (% [n])	70 (31)	56 (31)	63 (62)
Prescribed psychotropic medication in past 30 days ^a	30 (13)	20 (11)	24 (24)
ASI psychiatric composite score ^a			
>0 (% [n])	73 (32)	56 (31)	64 (63)
For those >0 (mean±SD)	0.19±0.31	0.37±0.34	0.33±0.16
Prior mental health treatment episodes ^a			
With >0 inpatient treatments (% [n])	36 (16)	33 (18)	34 (34)
No. of inpatient treatments for those >0 (mean±SD)	3.94±3.68	8.12±7.31	6.18±6.19
With > 0 outpatient treatments (% [n])	39 (17)	35 (19)	36 (36)
No. of outpatient treatment for those >0 (mean±SD)	2.76±5.77	4.74±7.01	3.81±6.44

p*≤0.05; *p*≤0.01, ****p*≤0.001^aOne participant (mobile phone nonuser) declined to answer all mental health questions

mailed to a homeless agency's address ($n=8$, 27%), sent via text message from the mobile phone provider ($n=6$, 21%), or sent via Internet ($n=1$, 3%). Approximately one-fifth ($n=6$, 21%) of those with mobile phones reported not receiving bills at all and just remember to pay each month. Participants reported paying their mobile phone bills with monies from welfare checks (General Assistance, Social Security, Disability) ($n=10$, 34%), work ($n=6$, 21%), panhandling ($n=5$, 17%), and relatives or friends ($n=4$, 14%). Four participants (14%) did not answer this question.

Participants with mobile phones spent between 4 min (0.067 h) and 122 h on their phones in the past 30 days (Table 3). Respondents placed or received calls between 2 and 384 times, with a median of 34 times in the past 30 days. They spoke with 1 to 59 people, with a median of 5. Twenty-seven participants (61% of those with mobile phones) reported either sending or receiving at least one text on their phone in the past 30 days. Participants sent or received texts between 1 and 883 times, with a median of 11 texts. Participants texted with one to seven people, with a median of one person. Nine participants (20% of those with mobile phones) accessed the Internet through their mobile phones at least once in the past 30 days. They accessed the Internet between 1 and 30 times, with a median of 30 times. They used between 5 and 6,000 min on the Internet, with a median of 420 min.

The principal investigator examined relationships of mobile phone possession and use with demographic, homeless, substance use, and mental health variables. Only two variables were associated with mobile phone possession (and consequent voice communication). Participants with a high-school degree or GED and fewer total years of lifetime homelessness were more likely to have a mobile phone than others (education: 79% vs. 51%; $\chi^2=7.81$, $df=1$, $p=0.005$; years homeless: Wald $\chi^2=9.61$, $df=1$, $p=0.002$, $B=-0.09$, $SE=0.03$). Only one variable was associated with text messaging. Of participants with a mobile phone, those who experienced more than one episode of homelessness were more likely to text than others (79% vs. 40%, $\chi^2=7.06$, $df=1$, $p=0.008$).

Reasons for Mobile Telephone Use

Participants placed and received calls, sent and received text messages, and used the Internet through their mobile phones for a variety of reasons. Reasons principally encompassed issues of safety, responsibility, and social connectedness.

Safety. Although no participant used a mobile phone for an emergent situation in the past 30 days, 14 participants did mention that mobile phones are important for safety reasons. Two participants explain the relationship between having a mobile phone and a feeling of safety as follows:

Cell phones are good especially if the person has health problems. It's like a security. Help is a phone call away.... They should provide cell phones for people with chronic medical issues.

In times of emergency like when you got attacked. Homeless people gotta be protected, too.

Responsibility. In the past 30 days, almost one quarter ($n=10$, 23%) of those with mobile phones spoke with a potential or current employer about work. One participant searched for jobs on the Internet via his mobile phone. Participants explained that mobile phones allow them to follow up on employment applications

TABLE 3 Mobile phone voice calls, text messages, and Internet use

	% Total sample	% Participants with mobile phone	Mean $\pm$ SD for those ≥ 1	Median for those ≥ 1	Mode for those ≥ 1	Minimum	Maximum
Phone calls							
Placed or received ≥ 1 phone call	44 (44/100)	100 (44/44)	—	—	—	—	—
Total no. of phone calls (placed and received)	—	—	70.31 $\pm$ 83.86	34.00	34	2	384
Total no. of unique people spoke to (placed and received calls)	—	—	6.52 $\pm$ 8.63	5.00	2	1	59
Total no. of minutes used (placed and received calls)	—	—	1,039.18 $\pm$ 1,619.30	374.00	— ^a	4	7,300
Text messages							
Sent or received ≥ 1 text message	27 (27/100)	61 (27/44)	—	—	—	—	—
Total no. of text messages sent and received	—	—	123.38 $\pm$ 221.79	11.00	1	1	883
Total no. of unique people texted with (either sent or received)	—	—	2.84 $\pm$ 2.36	1.00	1	1	7
Internet use through cell phone							
Accessed Internet ≥ 1 time	9 (9/100)	20 (9/44)	—	—	—	—	—
Total no. times accessed Internet	—	—	21.00 $\pm$ 13.54	30.00	30	1	30
Total no. of minutes used (for Internet use)	—	—	1,183.75 $\pm$ 2,035.89	420.00	5	5	6,000

^aEach participant reported a unique number of minutes; therefore, there are multiple modes.

by placing calls to potential employers. Even more important is the ability to receive calls from potential or current employers—otherwise, participants may or may not receive any messages left for them. Two participants describe how a mobile phone could facilitate their ability to work in this way:

The job could call me instead of calling someone else and leaving no message.

Being able to receive a call when work is available.

One participant reported speaking with a landlord about the rent and security deposit needed to lease a room. Sixteen percent ($n=7$) of those with a mobile phone spoke with helping professionals, such as caseworkers, counselors, and physicians, about their “personal business” in the past 30 days. One participant explained that his mobile phone is a critical element in his effort to remain drug-free. He calls approximately 50 people each day, many of whom are providers, to check in with them:

If I don't answer my phone, you know I'm in trouble. I always answer my phone, unless I'm in group...I call people every day when it's easy because that makes it easier to call them when it's hard.

Social Connectedness. Almost three quarters ($n=31$, 70%) of those with mobile phones talked to at least one family member on their phone in the past 30 days, and one third ($n=9$, 33%) texted with them. Participants spoke with family members to “check in,” “let her know I'm still alive,” and “catch up” ($n=30$). They asked for advice and feedback and used family members as “sounding boards” ($n=2$) as well as made plans to visit ($n=2$). In text messages, they “checked in” ($n=3$), made plans to visit ($n=3$), received encouragement ($n=2$), and shared jokes ($n=2$) with one another. One participant received a text from a man who was his biological son, a fact previously unbeknownst to the participant.

One third ($n=15$, 34%) of those with mobile phones spoke with “friends,” and two thirds ($n=18$, 67%) texted with “friends” in the past 30 days. Participants used mobile phones to “check in” and “catch up” with friends ($n=15$). They also made plans to meet with one another ($n=14$). In texts, they “checked in” ($n=6$), discussed plans ($n=5$), shared jokes ($n=3$), provided wake-up calls ($n=2$), and answered questions ($n=2$). One participant explained how a mobile phone can help someone who is living on the streets:

If they have someone who cares for them, they have access to them.

Some study participants offered explanations for why they do not have a mobile phone. Nineteen participants mentioned lack of funding, eight were concerned about mobile phone loss or theft, and seven reported a mobile phone was not currently one of their top priorities. One participant stated it this way:

I need some money, not a phone. I need a place.

Five participants dislike mobile phones, and three borrow mobile phones from others when they need to place a call. Three participants plan to acquire a mobile phone in the near future. One participant reported having no one to speak with.

DISCUSSION

This investigation's purpose was to examine if and how the street homeless use mobile phones. To our knowledge, this investigation is only the second to examine

mobile phone use among the homeless, and it is the first to examine it among the street homeless. A substantial proportion of the sample reported having a mobile phone (44%), debunking common homeless stereotypes. This sample was comprised of longer-term homeless men and women (only 15% had fewer than 3 years of lifetime adult homelessness), demonstrating that these findings are not simply an artifact of the recent housing crisis and downturn in the US economy (although this is an area ripe for further study).

The general population, compared to this study's sample, has higher rates—virtually double—of mobile phone possession (89% vs. 44%).⁶ Participants explained that funding, fear of loss or theft, and priorities (e.g., securing stable housing) prevented them from acquiring and maintaining mobile phones. For those in the sample who have a mobile phone, it seems to be an important asset. When searching for jobs, a mobile phone allows potential employers to contact the potential employee directly. When searching for rooms, a mobile phone allows potential landlords to contact the potential lessee directly. When trying to maintain sobriety and clean time, a mobile phone allows instant access to one's support systems. An interesting finding was that although sex, age, education, and race are related to mobile phone use for the general population,⁶ only education was related to mobile phone use in this investigation—in the reverse direction of that in the general population. That is, those with a high-school degree or GED were more likely, not less, than others to have a mobile phone. More studies are needed to examine this phenomenon. Finally, among the street homeless, a mobile phone may represent a distinct sense of social connectedness, for which housed individuals rarely encounter the need. This need for connectedness may outweigh the other factors of sex, age, and race.

A substantial proportion of this sample desire a mobile phone for safety, and these desires are not unique to the homeless. Two recent studies found that between 82% and 89% of mobile phone users in the general population reported that their mobile phone was extremely important for emergency use.¹⁹ In fact, one of these studies found that almost half (48%) of mobile phone users placed a call or wrote a text in an emergent situation, and one fifth (20%) received an emergent call or text on their phone. Some programs, such as "Secure the Call," have distributed emergency mobile phones—designed to dial 911 only—to battered women's shelters, senior citizen centers, school crossing guards, and school bus drivers. In this same vein, perhaps emergency mobile phones could be distributed to people who sleep overnight on the streets. Indeed, because the homeless are especially vulnerable to assault,^{20–22} mobile phones could potentially be an even more vital asset.

Several participants in this investigation who do not currently have a mobile phone expressed that they would like a mobile phone to place and receive calls and text messages when searching for employment and stable housing. In the general population, two thirds (66%) of mobile phone users reported that their phone was extremely or somewhat important for employment-related issues.¹⁹ Over one quarter (27%) of all mobile phone calls were about work or money in the study. Forty percent of mobile phone users in blue-collar jobs and 27% of users in white-collar jobs reported receiving benefit from their mobile phones in terms of work and pay. Strikingly, Sullivan¹⁹ argues that low-income households, earning less than \$35,000 per year, without mobile phones could potentially gain between \$2.9 and \$11 billion in aggregate income, if they were provided with mobile phones and used them to find work. Extending this to the street homeless community—where in this study, 65% were unemployed and the median income was \$463—it seems likely

that even modest increases in mobile phone possession and use could be of enormous economic benefit.

Many participants in this investigation used mobile phones to maintain contact with the people who care about them, primarily family members, friends, and providers. While the literature indicates that homeless people have relatively small social support networks,²³⁻²⁷ in this investigation, 44% of participants have at least one person in their networks with whom they speak, and 27% have at least one person with whom they text on their mobile phones. Perhaps, one reason for the smaller social support networks among the homeless is the lack of ability to maintain contact with these supports. Although a proportion of homeless people, particularly those with substance use problems, may have severed relationships with family members and friends, it is possible that others have small networks because they simply do not have access to landlines, money for pay phones and public transportation, or the physical ability to walk long distances to visit loved ones. This inaccessibility could be one contributor to feelings of isolation and despair. If offering homeless people mobile phones could increase their sense of social connectedness, it could likely increase self-esteem and mental health as well.²⁸

Providing mobile phones to homeless individuals could potentially yield additional benefits for the homeless community. For instance, Chayko's^{29,30} work on "portable communities" and Rheingold's^{29,30} work on "smart mobs" explain how mobile phones (particularly text messaging) allow for groups of strangers to meet one another, organize around a common cause, and unite to take collective action in ways not possible before this technology emerged. With vision, leadership, and creativity, the homeless community could use mobile phones to organize and publically demand safe and affordable housing, jobs, adequate health care that includes prescription coverage, and other such measures that exemplify dignity, respect, and full membership in society.

These findings need to be interpreted with caution due to the study's limitations. Participants were recruited from one neighborhood in one US East Coast city using a snowball sampling technique, so the generalizability of these findings is unknown. The reliability and the validity of the technology interview questions are also unknown because the instrument was created for this study. Note that no participant reported using a mobile phone in the conduct of illegal activity. Participants either omitted such communications from their responses or disguised them as communications with "friends (about) meeting" or in some other fashion. The role of mobile phones in such illicit activities could be examined in future studies.

Despite such limitations, this investigation is the first to examine the mobile phone use of people who sleep overnight on the streets and only the second to examine mobile phone use among the homeless. For these reasons, this investigation can be viewed as an imperfect but important contribution to the scientific literature. A logical next step could be to examine physical and mental health outcomes in relation to mobile phone possession and use.

If these findings are replicated by other investigators in other parts of the country with other homeless individuals, then there are potential practice and research methodology implications. In the area of public health, mobile phone technology could be used to disseminate information to the homeless population. One idea can be extrapolated from universities. Some universities disseminate emergent information via text message to all employees and students. Perhaps, text messages could be sent to homeless people about locations at which they can eat,

sleep, and acquire necessities during extreme weather conditions—emergencies unique to the street homeless. Information about influenza vaccinations and other infectious disease outbreaks could also be disseminated in this manner with obvious public health ramifications.^{31,32}

Regarding health care practice, technology could be used to enhance communication between homeless clients and their health care providers. Providers could potentially check in with their clients via voice or text message. Conversely, clients could access on-call case managers using mobile phones in times of crisis. Another idea could be modeled after a research intervention involving substance abuse. In a successful feasibility study, Kuntsche and Robert³³ sent text messages each Saturday and Sunday to their study participants asking about their intentions of drinking that night. Perhaps, supportive sobriety and clean time text messages could be sent to homeless people working toward recovery; reminder text messages could be sent about fellowship meetings as well. Prevention and intervention programs delivered through mobile phones for human immunodeficiency virus,³⁴ tobacco use,^{35,36} and medication adherence³⁷ have been developed and found to be feasible and effective in various populations. If tailored appropriately, these programs may work with homeless people as well and potentially increase access to much-needed services at a relatively low cost.

Finally, in terms of research, Freedman and colleagues¹¹ have already piloted a study of data collection using mobile phones with the crack cocaine-using homeless, and such data collection may be feasible with other homeless populations as well. Texting may also be an option for data collection, particularly with younger homeless populations. In their work with young people (16–24 years of age), Haller and colleagues³⁸ found no differential response rate between those asked to respond to a survey question via text message (80%) and those asked to respond on a note card (85%). Texting would allow people to enter their data at their convenience and their time and place of choice. With such a transient population, mobile phone technology has the potential to increase the precision, consistency, and length of follow-up in data collection efforts with research participants.

CONCLUSIONS

As the general population has turned to electronic methods of communication, the homeless population may be following. In this study of the street homeless—who many may assume do not use electronic communication methods—a substantial proportion of the sample reported having and using mobile phones. Providers and researchers should consider incorporating mobile phones into their prevention, intervention, aftercare, and data collection efforts. Electronic connectivity may be a next step in treating and studying this important and vulnerable population.

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