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Exploring the Potential of Technology-Based Mental Health Services for Homeless Youth: A Qualitative Study

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Abstract

Homelessness has serious consequences for youth that heighten the need for mental health services; however, these individuals face significant barriers to access. New models of intervention delivery are required to improve the dissemination of mental health interventions that tailor these services to the unique challenges faced by homeless youth. The purpose of this study was to better understand homeless youths' use of technology, mental health experiences and needs, and willingness to engage with technology-supported mental health interventions to help guide the development of future youth-facing technology-supported interventions. Five focus groups were conducted with 24 homeless youth (62.5% female) in an urban shelter. Youth were 18 to 20 years old with current periods of homelessness ranging from six days to four years. Transcripts of these focus groups were coded to identify themes. Homeless youth reported using mobile phones frequently for communication, music, and social media. They indicated a lack of trust and a history of poor relationships with mental health providers despite recognizing the need for general support as well as help for specific mental health problems. Although initial feelings towards technology that share information with a provider were mixed, they reported an acceptance of tracking and sharing information under certain circumstances. Based on these results, we provide recommendations for the development of mental health interventions for this population focusing on technology-based treatment options.

Keywords

homeless youth; qualitative; mental health; intervention; mobile application

It is estimated that on a given night, almost 53,000 youth ages 18 to 24 are living on the streets, in a shelter, or an alternative living situation (Henry, Shivji, de Sousa, Cohen, & Abt Associates, 2015). Another recent report estimates that during a year, roughly 550,000 youth 25-years-old and younger, experience a homeless episode lasting longer than one week (Henry, Cortes, Morris, & Abt Associates, 2013). Among homeless youth, a large need exists for mental health services. Family problems are a major factor contributing to youth

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homelessness (National Coalition for the Homeless, 2007; Whitbeck, 2011). Rates of abuse are high among homeless youth with 77% of homeless youth reporting physical abuse, sexual abuse, or both (Ryan, Kilmer, Cauce, Watanabe, & Hoyt, 2000). Given this background, it is not surprising that homeless youth experience disproportionate rates of emotional and behavioral problems, including suicide, high risk behaviors, and psychiatric disorders (Castro et al., 2014; Quimby et al., 2002; Slesnick, Prestopnik, Meyers, & Glassman, 2007). Estimates suggest that nearly two-thirds of homeless youth meet criteria for a psychiatric disorder (Cauce et al., 2000) with particularly high rates of depression, post-traumatic stress, alcohol and substance abuse, and conduct disorders (Whitbeck, 2011).

Despite an increased need for mental health services, homeless youth have insufficient access to care and frequently use emergency rooms when health needs can no longer be ignored (Ensign & Bell, 2004). Barriers to access in this population include lack of affordable insurance, inability to pay medical expenses, shortage of appropriate health care providers, distrust and concerns regarding confidentiality, and a lack of knowledge about consenting to mental health treatment (De Rosa et al., 1999; Hudson et al., 2010). In addition, the formats of traditional mental health services are unlikely to fit the chaotic and nomadic lifestyle of homeless youth. As such, this population is traditionally underserved in their needs and access to mental health services (Edidin, Ganim, Hunter, & Karnik, 2012). In light of these issues, new models of intervention delivery are required that improve the dissemination of psychological resources, while tailoring these services to the unique challenges faced by homeless youth.

While access to health care services is insufficient and much lower than the general population, homeless youth have a level of access to mobile technologies comparable to other youth. As of 2015, 88% of teenagers reported owning or having access to a cell phone or smartphone, and 92% of teens use the Internet daily (Lenhart, 2015). Teens and young adults use phones, the Internet, and other tech devices for various reasons including communication, establishing and maintaining friendships, searching for information, and recreation/entertainment (Lenhart, 2015; Rice & Barman-Adhikari, 2014). Despite poor access to many resources, remaining connected to technology is a priority for homeless youth (Goldberg, Karnik, & Hunter, 2013). In fact, technology use among homeless youth is very similar to that of their housed counterparts and college students (Woelfer & Hendry, 2010). One fourth of homeless youth report using the Internet for more than one hour a day (Rice, Monro, Barman-Adhikari, & Young, 2010). Rates of smartphone ownership are also high among homeless populations, particularly for those ages 18 to 29 (McInnes, Li, & Hogan, 2013; Post et al., 2013). Thus, despite perceptions of a “digital divide” in access to technology, mobile technologies are commonly used among homeless youth.

Mobile technologies have been increasingly used to deliver health and mental health care resources. Mobile mental health interventions make use of the ubiquity of smartphone ownership to provide interventions that can reach people where they are at, including the times and places people need them the most (Harrison et al., 2011). Mobile mental health interventions have made use of various technologies including tele-therapy, text messaging, and mobile apps (Mohr, Burns, Schueller, Clarke, & Klinkman, 2013). Some interventions even combine several of these elements to make engaging interfaces intended to meet the

needs of their target end users (Gustafson et al., 2011). Despite the high potential of mobile mental health to be useful for homeless youth, few attempts have been made to develop programs specifically for this population. Formative work is required to ensure that programs will meet the needs of this population, particularly given evidence that perceived usefulness is critical determinant of the uptake of technological systems (Venkatesh & Bala, 2008).

In line with recommendations from participatory design approaches (Marcu, Bardram, & Gabrielli, 2011), we aimed to involve homeless youth in the design process by soliciting information about their experiences, needs, and interest with technology and mental health services. The goal of the current study was to collect information to support the development of technology-based solutions that would address homeless youths' mental health concerns, while also taking into consideration what this population would find appealing and helpful. We conducted focus groups to examine the attitudes of homeless youth in several areas related to mental health and mobile technologies. These areas included attitudes toward health care and mental health treatments, relevant points of intervention (e.g., sleep, substance use, risk behaviors), their use of mobile phones and technology, and security and privacy concerns with using technology. In this article, we summarize the findings from these focus groups and discuss implications for further work exploring the use of technology to provide mental health interventions to homeless youth.

Method

Participants

Homeless youth were recruited via referrals from case managers at a youth homeless shelter located in a large urban city. Individuals who participated in the focus groups met the following inclusion criteria: (a) English-speaking, (b) homeless, (c) aged 18 – 22 years old, (d) currently sheltered, and (e) willing and able to comply with requirements of the study protocol. We had no eligibility requirement regarding access or use of technology. Homelessness was defined as lacking “a fixed, regular, and adequate nighttime residence”, and thus, currently sleeping in the shelter at least 50% of the nights in the past week (U.S. Department of Education, 2001).

Procedures

The main goal of the focus groups was to explore the difficulties homeless youth face with receiving mental health care to guide potential solutions to these problems, especially solutions that make use of technology-based resources. Borrowing methodologies from the participatory design model, these focus groups aimed to generate a creative and collaborative experience, to build understanding between researchers and the homeless youth, and to engage youth prior to any formal designs to help understand needs and resources (Muller, 2003). We focused on the youth stakeholder group, rather than staff, as our goal was to design youth-facing tools that could be used regardless of living situation (i.e., sheltered or unsheltered) or staff involvement. Focus groups lasted 90-minutes and took place at the shelter during a time that was convenient for all shelter residents (6:00-7:30pm, as not to interfere with school or work obligations). Participants were compensated with a

\$15 gift card and dinner was provided during the focus group sessions. Five focus groups were conducted consisting of 4–6 participants per group along with 2–3 facilitators from our research team, resulting in 24 homeless youth participating in this study. The study was approved by the Institutional Review Board at Rush University Medical Center.

Informed consent was obtained at the beginning of each focus group. Participants were instructed to keep all information discussed during the group confidential. In order to respect privacy, only the first names of all group members were used. In addition, participants were reminded that their participation was voluntary and that they were not required to disclose anything that would make them uncomfortable. Following this disclaimer, a brief demographics questionnaire which collected information about age, gender, sexual orientation, race, ethnicity, education, and homeless experiences was administered. A semi-structured interview was used to guide a collaborative discussion of the youths' needs and expectations for a smartphone-based mental health intervention (Table 1). The semi-structured interview explored four main topics: current use of technology, experiences with the mental health system, target areas of mental health concerns, and privacy and security related to the use of technology-based interventions. Interviews were audio recorded to facilitate transcription and analysis of focus group data.

Analysis

The interviews were audio recorded, transcribed, and coded using ATLAS.ti (Muhr, 1997). Analysis was guided by the grounded theory approach, which provides a structure and techniques to interpret and organize the data. Grounded theory is a qualitative method that focuses on the evaluation of data in order to generate new theoretical explanations, rather than testing a previous theory (Strauss & Corbin, 1990). As such, themes are allowed to emerge and change over time as new insights are uncovered and new data is gathered. Coding began after the first focus group was transcribed. The lead author, who did not participate in the focus groups, led the coding. Coding was conducted by creating labels to describe and reduce the data while maintaining the substance of the text (Charmaz & Belgrave, 2002). As the data were coded, the lead author created codes for each new idea and made memos of emerging interpretations and alternative conceptualizations. As similar codes emerged, these codes were grouped into themes and reviewed with the senior author. Themes were modified throughout the analysis as they were compared to one another, to new codes, and to new data. Once all of the data were coded and all themes identified, the lead author again reviewed themes with the senior author (who led all focus groups), adjusting and consolidating themes where necessary. Grounded theory continues until theoretical saturation is obtained, which means that the themes maintain consistency and little information is gained by additional data. Saturation was reached after the fifth focus group. Because codes and themes evolve over the analysis, consistency is reached through constant comparison among the data and consultation among the research team members.

Results

Sample Characteristics

The sample consisted of 24 homeless youth with an average age of 18.8 years ($SD = 0.8$). The sample was 62.5% female and 66.7% African American. About 47.8% were in school and less than half were employed. Participants reported an average of 3.3 ($SD = 2.6$) homelessness episodes in their life, with the longest episode lasting an average of 10.7 months ($SD = 13.4$). Complete demographics are displayed in Table 2.

Focus Group Results

Technology Use Information—All participants reported owning a mobile phone. The most common problems participants reported with use of their mobile phones were battery life, breaking phones (e.g., cracked screens, water damage), and difficulty charging the phone. Many youth reported carrying phone chargers with them wherever they went. In fact, in every focus group conducted several youth plugged in their phones to charge because they knew they would be in a single place for 90 minutes. Typical uses of their mobile phones included communication (texting, phone calls, etc.), practical uses (alarm clock, navigation/transportation, information seeking, homework, job applications), music, pictures, entertainment (movies, TV, YouTube, Netflix, games, art, shopping, reading), and social media. Communication, music, and social media were mentioned the most, totaling over 50 references, whereas all of the other uses were only mentioned 5 times or less.

Experience with a Mental Health System—When participants discussed experiences with mental health services, twice as many negative accounts were shared than positive accounts.

Negative: The most common frustrations the youth discussed when asked about their experience with mental health services included feeling like that providers did not listen to them or consider their view, a lack of relationship or rapport with the provider, and the perception that providers only wanted quick solutions, especially medications.

The absence of rapport between a mental health provider and the patient appeared in approximately 50% of the codes relating to mental health experiences. Many of the youth reported that they felt like the provider did not know how to relate or talk to them, did not take their perspective, did not ask them questions, or did not share anything about themselves.

“...my issue with therapists is they don't share nothing about them so it's like you only bringing one part to the table. I'd think for a second you could at least tell me that you was a kid before but they can't even share that. They can't, I don't like one way sharing. That don't make people feel safe, just because you say stuff that's confidential don't mean it's confidential. I could easily sign a release of information. You could share anything. So my thing is you gotta put something on the table too because I ain't a one street girl. You know I'm not gonna pour my heart out to you and tell you directly how I feel and then everything I say you can just run with but you ain't putting, you ain't telling me nothing about yourself.”

Youth also reported an underlying frustration in that they felt as if they were not being heard. The youth described several situations where they felt that therapists, counselors, or doctors only listened to their parents or one side of the story. One youth described her experience:

“I remember that about therapy that I never felt like I got listened to. I felt like it was supposed to be for me but the only one who was talking was my mom. The only one they were listening to was my mom.”

Finally, the youth discussed several situations in which they felt that the provider only wanted quick solutions. They described experiences in which they felt they were over diagnosed, medicated, and hospitalized. This went hand-in-hand with not feeling heard by the provider, particularly around the use of medications. Many youth felt like they did not need or want to be taking medications or that the medications were not helping, yet doctors would prescribe a higher dose or more intense medication.

“They forced me to take some type of medication and then I told them it doesn’t help my anger because my anger is not in like my head, it’s coming from the situations that I go through. And they told me that okay well we’re going to up your dosage. So I went from 20 mg to 40 mg then to 80 mg, which is close to lithium. Then I told them well it’s still not doing anything, so they put me on a mood stabilizer.”

One participant described a situation in which her legal guardian would hospitalize her anytime she would get angry. Instead of the hospital following up with her living situation, they would medicate her and send her back into the same living environment.

“Then, I was constantly in there, constantly in there. I was in there at least six times for little stuff. ... I feel like they should try to bring the law in some type of way because it don’t be fair when minors be going through something really emotional and it be something wrong with them and their guardians or whomever, watching over them, is not treating them correctly and it triggers different types of emotions out of them, and they’re already dealing with stuff that they should be having to deal with at a young age...Once I left them they sent me with whoever came and got me, not knowing how they were going to treat me, knowing that I’m not emotionally stable, and then they just prescribed...I feel like they prescribed me anything. I didn’t like that.”

Positive: Fewer positive experiences with mental health services were shared. Some positive experiences included times in which therapists successfully built rapport, stayed neutral, empathized, and helped the youth with problems they felt were important.

“I had a therapist...I think she was like the most neutral lady I’ve ever met. I mean she obviously showed emotion towards something things, but as far as like the way she went about helping with like my depression and stuff because I used to be depressed like every day all day, just based on what I was going through. But the lady, she kept it professional but she made it seem like she was part of my family in a way where she made me connect with my mom...I felt like therapy where like how she said they actually share with you information about (inaudible) just not a

one-sided conversation like yeah, I need help with this and I'm here because of this. And she's like you know I actually dealt with this in my life where blah, blah, blah happens so I feel like for it to be successful like it to be successful like relationship or successful therapy like the other, the helper needs to vent also so whoever is receiving it feels like okay they actually know what they're talking about or that actually seems like a pretty good idea because look at how they are now."

Potential for Mobile Technology to Address Mental Health Needs—Many participants reported that they would be interested in using a mental health, mobile phone application for general emotional support. This included seeking help with life decisions, planning, day-to-day stressors, problem solving, advice, and difficulties related to homelessness.

"Personally I think just like you know advice. I'd probably just like anything, just daily things, more so I'd probably just use this app to you know have somebody to talk to you know."

Another youth agreed, "Yeah, if you're having bad day, send a quick text, tell them the day's been kinda rough, send you like a text like hey, you want to talk, you know?"

In addition, participants reported that they could see themselves using a mobile phone intervention for mental health difficulties such as depression, anxiety, self-harm, abuse, substance use, emotional problems, insomnia, and stress. The youth also expressed that they would want help with anger management and relationships.

Most youth reported they would see themselves frequently using mobile mental health applications. The lowest reported frequency, use of a mobile phone intervention once a week, was only endorsed by one youth. All of the other youth reported that they would want to use a mobile phone application frequently and/or whenever they wanted or needed, including multiple times a day, every day, or every other day. One youth underlined this sentiment with the quote that they would use such a tool "every time something would happen. She would be tired of me calling her phone."

When asked about the types of features they would like in a mental health application, participants gave a lot of positive feedback about the concept of receiving push notifications through an app in the form of quotes, videos, texts. For the most part, the youth expressed an interest in motivational messages, positive reminders, support messages, and tips about how to stay calm and manage relationships.

"Some people like motivation. Some people like to feel supported. A lot of people out here don't have a support system so some people are looking for someone to be like hey, keep this throughout the day, try not to complain for 24 hours."

Concerns of Cell Phone Information Sharing and Tracking—Participants were asked about how comfortable they would be if a mobile phone application would track and share information to provide tailored help such as phone usage or location information. The homeless youth differed in regards to their concern about tracking and sharing information

collected from their phones. Generally, the youth were negative about the idea that a mobile application could track and use information from their phone. However, about half of the youth felt positively about using information from their phone if they knew how it was collected, transferred, stored, and how it would be useful to them. In addition, participants felt better about sharing information if given the ability to turn such features off and on, if they could delete any information they did not want shared, if the information would be accessed a few months after it was collected, and if the information sharing was directly beneficial to them. For example, one participant liked the idea of being able to know when resources were located nearby.

“That’s cool. I like that. Like if it tells me like oh there’s a psychologist around the corner.”

Another participant thought it could be useful to track and share their mood and events over the week.

“And then you ain’t gotta try to think of everything you’ve been through all those days and then just shorten down the stuff that you have been through because you don’t remember something, so that’s good.”

One participant liked the idea of being able to check in with a therapist throughout the day:

“It could be like, if it could be like part of the app, it would be like an online chat, probably like with different therapists that’s like on call 24, 24 hours. It would be kind of cool too. You can put a problem up there and then they’ll come back to you.”

However, some participants did not like the idea of sharing their information:

“I’m not gonna share like my personal information with somebody and I don’t know nothing about them.”

Several participants who were comfortable with sharing location information reported they would still not share information corresponding to their calls or texts.

“...you know the location thing, ... it’s not really too personal in the sense of family lives, that’s more of a ... see where you’re at, let’s see where we can get you that would make you comfortable ... with the phone thing and contact thing, that’s kind of more of maybe I don’t really want you to know who I was talking to. That’s you know, that would be more personal...”

Discussion

The results of this study provide insight into homeless youths’ use of technology, past mental health treatment experiences, and potential uses of mobile technology to provide mental health services among homeless youth. Even though participants were not explicitly recruited because they owned a mobile device, all youth in this study owned a mobile phone. Although, it is worth noting that homeless youth might face more challenges with maintaining that phone (e.g., keeping it charged and functional). Not surprisingly, the youth reported using their mobile phones most frequently for communication, social media, and

music, followed by practical uses, pictures, and entertainment. These findings not only parallel technology usage among their housed counterparts, but also confirm recent findings on usage patterns in homeless youth (Goldberg et al., 2013; Karabanow & Naylor, 2010; McInnes et al., 2013; Post et al., 2013; Rice & Barman-Adhikari, 2014).

Homeless youth in this study described a wide range of experiences with mental health care. A very important aspect of mental health treatment for this underserved population was underlined in their negative experiences with building relationships and trust with the provider. In addition, they recounted many instances of over diagnosing, medicating, or hospitalizing, which only further exacerbate feelings of mistrust. Not surprisingly, positive experiences shared touched on several of the same themes of trust and relationships but demonstrated ways that therapists had been able to address these successfully. These included sharing personal information, empathizing and validating, and addressing the youths' needs. Thus, the experiences of these homeless youth would suggest a focus on the therapeutic alliance, building trust, and allowing youth to guide their own treatment plan. One potential benefit of using mobile technology to deliver mental health interventions is that it may help to overcome feelings of mistrust that are common in this population and give homeless youth a feeling of control over their treatment experience. Research shows that individuals are able to develop a bond through mobile interventions (Ben-Zeev, Kaiser, & Kros, 2014) and even develop positive feelings towards interventions that they know are automated (Aguilera & Muñoz, 2011). In these ways technological interventions that provide frequent outreach to youth may be one way to build rapport and this strategy is consistent with the youths' report in this study that they would like frequent push notifications for emotional support, encouraging, motivation, and coping skills.

Generally, the youth responded positively to the idea of a mobile phone application that could provide mental health care. A majority of the youth stated they would use such a tool multiple times a week. Only one participant reported that he or she would use an app once a week. This was the lowest reported utilization frequency, but it does not suggest a lack of interest or use in the technology intervention as it is comparable to the frequency most patients are able to see their mental health therapist in face-to-face intervention. It is worth noting that this usage differs considerably from the expected use for most mobile mental health interventions for youth and adolescents that follow a modular, weekly interaction style based on lessons and didactic content (see Schueller, Stiles-Shields, & Yarosh, in press). Instead, this pattern of interaction is more akin to other forms of mobile applications that contain features for small, frequent interactions, especially with a particular goal in mind (e.g., Morris, Schueller, & Picard, 2015; Birney, Gunn, Russell, & Ary, 2016; Lattie et al., 2016).

Some of the topics youth stated they would seek help for included mental health problems, general emotional support, relationship difficulties, and anger. While the youth wanted help for mental health problems like depression and anxiety, they preferred to deal with these issues with a therapist while preferring mobile application features such as push notifications for general motivation, inspiration, support, tips and skills. Indeed, brief messages through e-mail and text have been useful to provide mental health services by themselves (Morgan, Jorm, & Mackinnon, 2012; Whittaker et al., 2012), in adjunct with other treatment (e.g.,

Aguilera & Muñoz, 2011; Ben-Zeev et al., 2014) and even in settings where mental health problems typically present but few resources exist for treatment, such as emergency rooms (Ranney et al., 2016). As such, it might be useful to conduct further explorations in the type of messages and message content that would be most appealing for this population as has been done in other areas (e.g., Muench, van Stolk-Cooke, Morgenstern, Kuerbis, & Markle, 2014).

The homeless youth were divided when they were asked about how they would feel if a mobile phone application could track and share information to provide tailored help. Trust is a reoccurring theme that is clearly important to this population. These homeless youth wanted the ability to have a say in what information was being shared and felt better about the idea when they understood the benefits and reasons for tracking and sharing information. Indeed, feeding information back to providers is a useful way to leverage technologies to guide evidence-based practices. In one example, a medication monitoring system made possible through a mobile app and wireless pillbox collected information about medication adherence, symptoms, and side effects to people receiving new regimens of antidepressant medication (Corden et al., 2016). Indeed most people had office visits with physicians to monitor and adjust their dosage according to information received from the application during the 4-week trial, which is atypical for common practices in primary care (Mohr et al., 2015). Given that many of the youth expressed displeasure with the use and dosing of medications they received, tools that provide quick, actionable information to providers could be quite useful with this population.

It is worth noting that although our goal was focused on developing technology-supported services for homeless youth, many of the themes that emerged are relevant to non-technological services as well. The youth reported a history of overwhelming negative interactions with the mental health system and a desire to receive frequent support on a variety of topics ranging from relationships to emotion regulation and saw benefit in the form of brief but frequent outreaches, encouragement, and motivational support. Although the solutions proposed, such as push notifications, the availability to call or text a mental health professional, involved technology, one could also imagine addressing these issues through other means.

Limitations

These findings need to be interpreted with the study's limitations in mind. Participants were recruited from one homeless youth shelter in a large urban city and were selected by the shelter's case managers as being a good fit for the study. Thus, it is unclear whether these findings would generalize to unsheltered youth or if other characteristics of our participants made them more likely to be identified by our case management. In addition, the questions asked during the focus groups were adapted as more sessions were completed. Therefore, themes that were present in early focus groups may have guided questioning in subsequent groups. This practice, however, is common in qualitative work, in which the goal is to allow themes to emerge and to gain more information about those areas (Strauss & Corbin, 1990). Also, individual participants were not identified during the transcription process. Therefore, we could not analyze if certain characteristics of the participants (e.g., history of

homelessness, mental health characteristics) impacted their feelings to any of the topics discussed during the focus groups. Furthermore, we were not able to identify how many youth actually endorsed each topic or statement discussed. As such, a highly vocal youth might be more likely to impact the discussion and thus the prevalence of a particular theme. We appreciate that this is often a concern when conducting the focus groups, and group moderators used several methods, such as soliciting feedback from each user through writing ideas on sticky notes, looking for overlap and themes within each group, and having focus group members vote or indicate their preference with a thumbs up or thumbs down. Finally, based on participatory design principles, we focused this investigation on youth stakeholders. This overlooks input from the shelter staff or other organizational leaders. We focused on youth because this study was meant to inform the development of a youth-facing intervention that would not require the involvement of the shelter staff and could be used whether or not a youth was currently sheltered. However, future research should take into consideration the views and experiences of other stakeholder groups as their input, needs, and workflow might identify additional requirements and might contribute to scalability and sustainability of developed resources.

Conclusions

Access to mental health services is limited among homeless youth, and thus, new intervention models must be considered in order to provide the necessary care. Based on our findings, future interventions should address the barriers to mental health access while taking into consideration the importance of trust and rapport between providers and homeless youth, and the desire for general support and help with mental health problems. While it is sometimes assumed that homeless youth do not have access to technology, our findings validate other recent work demonstrating that homeless youth access and use mobile phones regularly, especially for communication, music and social media. Technology-supported interventions provide a potential avenue for reaching homeless youth and addressing their mental health needs. Researchers utilizing technology-supported interventions should be transparent regarding the risks and benefits of the mobile phone platform, especially if data sharing occurs. Allowing homeless youth to have a say in what information is tracked and shared is critical for building their trust. Further research is needed to validate the findings of this study in other homeless youth populations and support the development of technology-based platforms for delivering mental health services to homeless youth.

Overall though we have highlighted several potential features that could be present in future resources to meet the needs of this population. Apps and programs should focus on providing frequent, actionable information possibly through e-mails, text messages, or push notifications. Furthermore, monitoring and feedback systems that help youth stay connected with providers and pass useful information (such as symptom change and side effects of medications) might help guide evidence-based practices when frequent office visits are not possible. Future research projects and efforts should make use of the findings from this study to develop apps and programs to address the mental health needs of homeless youth while being mindful of convenient and feasible ways to receive mental health services. We believe novel types of services such as technology-supported programs have the potential to

transform and expand mental health care for this population and address the overwhelming need in a context where traditional resources are insufficient.

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Table 1**Semi-Structured Interview Questions**

Smartphones

What has your experience been of using smartphones in the past?

Can you tell me about some of the things that (could) get in the way of you using smartphones?

For what types of things do / would you use a smartphone for?

Is there a particular time of day when you (would) use a smartphone more? Less?

Can you tell me about your charging habits, for example when and where you charge your phone?

Where do you keep your phone when you're not using it?

If an app could provide you with tips or skills for improving your wellness or mental health, what would you think about that?

Do you think you would use it? Why or why not?

Do you currently use any health or wellness apps or websites?

If there was an app to help you with your sleep, do you think that would be useful to you?

Why or why not?

If you could talk to a licensed therapist to get advice once a week over the phone, would you take advantage of that opportunity?

What are some drawbacks to talking to a therapist over the phone?

What could get in the way of you having these phone-based sessions?

How valuable do you think these discussions would be?

Is there anything in particular you would want to talk to the therapist about?

Anything you would *not* want to talk about, or not feel comfortable with?

Sleep / Mental Health

In thinking about the last two weeks, how would you say your sleep has been, generally?

What are some of the things that get in the way of you getting a good night of rest?

What do you think is the number one health issue affecting other youth who are homeless right now?

To what extent do you think other youth like yourself would be willing to seek treatment for this if help was available?

To what extent do you think other youth would be willing to seek treatment for this using a Smartphone?

What do you think is the number one emotional issue affecting other youth who are homeless right now?

To what extent do you think other youth like yourself would be willing to seek treatment for this if help was available?

To what extent do you think other youth would be willing to seek treatment for this using a Smartphone?

Attitudes toward the health system

Can you tell me about your experiences with health care systems, if at all, during the time in which you've been without a home?

Did the encounter meet your **healthcare** needs?

Did the encounter meet your **emotional** needs?

What are some of the things that get in the way of seeking treatment for **healthcare** needs?

What are some of the things that get in the way of seeking treatment for **emotional** needs?

What is your level of trust or confidence in the healthcare system?

Table 2

Demographics

Variable	<i>M</i>	<i>SD</i>
Age (years)	18.8	0.8
First age homeless (years)	17.0	1.4
Number of times homeless	3.3	2.6
Variable	<i>n</i>	%
Male	9	37.5
Female	15	62.5
Ethnicity	-	-
Hispanic or Latino	6	26.1
Not Hispanic or Latino	17	73.9
Race	-	-
African American / Black	16	66.7
Central American	1	4.2
Mixed	5	20.8
Other	2	8.3
Highest degree achieved	-	-
Less than high school	12	50.0
High school diploma	8	33.3
GED	2	8.3
Some college	2	8.3
Employed	7	38.8
In school	11	47.8

Note. $N = 24$; missing values were present for several items resulting in $n = 22$ for age, $n = 23$ for age first homeless, $n = 23$ for number of times homeless, $n = 18$ for employed, and $n = 23$ for school.