



## A qualitative investigation of the barriers and facilitators to Hepatitis C virus (HCV) screening among individuals experiencing homelessness in Houston, Texas



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### ABSTRACT

**Background.** Individuals experiencing homelessness may be at a higher risk for hepatitis C infection because many are vulnerable to risk factors related to HCV. Screening is the very first step in the HCV care continuum, but it remains unclear how to improve HCV screening among this hard-to-reach population. Thus, the present study investigated the barriers and facilitators to HCV screening from the perspective of individuals experiencing homelessness within a non-residential social service setting. **Methods.** Individuals experiencing homelessness (aged 18+) were approached while they were seeking services at two community-based organizations in Houston, Texas, during August 2020. Participants ( $N = 31$ ) completed an interviewer-administered demographic survey and a semi-structured interview about their experiences with healthcare, homelessness, and HCV screening. Following transcript coding and content analysis, a thematic analysis was conducted to identify HCV screening barriers and facilitators discussed by participants. **Results.** Participants were predominantly male ( $n = 25, 80.6\%$ ), and almost 40% of participants had no form of medical insurance. Participants identified the following as barriers to HCV screening: mistrust of the healthcare system and professionals and lack of knowledge of HCV prevention, harm reduction, and complications. Participants identified the following as facilitators to HCV screening: providing incentives and increasing access and convenience to HCV screening. **Conclusion.** Community-based HCV screening programs may wish to account for the lived experiences of individuals experiencing homelessness in order to minimize barriers to screening. Client-centered strategies that reduce wait times and incentivize participation should be considered to eliminate barriers and increase convenience for this high-risk population.

### 1. Background

Hepatitis C (HCV) is a bloodborne illness with a higher death toll than all of the top 60 reportable infectious diseases combined [1,2]. Approximately 2.4 million Americans (~1% of adult population) are living with HCV [3,4], and about 1.8 million more are unaware of their status [5]. Individuals who are HCV positive and unaware of their status risk developing disease complications and transmission to others. As a result, it is a Healthy People 2030 priority to increase awareness of chronic HCV infection through early diagnosis and treatment to improve health outcomes [6,7]. The U.S. Preventive Services Taskforce (USPSTF) concluded that widespread HCV screening has substantial net benefit, but in order to adequately implement HCV screening recommendations, the barriers facing marginalized populations must be

eliminated [2]. Individuals experiencing homelessness are among these marginalized populations.

#### 1.1. Individuals experiencing homelessness

About 1.4 million people receive emergency shelter or transitional housing annually [8]. In 2020, there were 580,466 persons experiencing homelessness in the U.S., a 2.2% increase from 2019 [9,10]. The number of individuals experiencing homelessness is likely to increase due to the COVID-19 pandemic.

Individuals experiencing homelessness are at higher risk of HCV infection than the general population because they are particularly vulnerable to risk factors related to HCV, including substance use [11]. As a result,

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the prevalence of HCV among people experiencing homelessness is substantial, ranging from 9.8% to 52.5% [12]. Previous studies have also reported a prevalence of 57.6% and 37% [13,14].

Moreover, homelessness has been frequently associated with injection drug use, a risk factor for HCV infection [12,14]. Due to their lack of access to private space, individuals experiencing homelessness engaged in IDU are more likely to inject drugs in public [15]. Public injection drug use is associated with unsafe and unhygienic practices, including rushed use due to fear of arrest, reuse of syringes and other equipment, and refraining from carrying safe drug use equipment due to fear of arrest [15].

Previous studies have found that HCV screening was not a main priority for individuals experiencing homelessness, who have more urgent day-to-day survival needs [16]. Scarce knowledge of HCV prevention, distrust of healthcare providers, substance use, and mental illness have been identified as barriers to HCV screening among individuals experiencing homelessness living in a shelter [17,18]. In seeking care for HCV, people experiencing homelessness face financial barriers getting to clinics, long wait times, and fears of finding out bad news [19]. Additionally, when HCV care requires travel between sites, clients seldom show up [20,21]. Monetary incentives, transportation, and previous experiences with rapid testing have been reported as facilitators to HCV screening among individuals experiencing homelessness and individuals engaged in substance use [17,18].

### 1.2. Screening guidelines and rates

HCV is commonly transmitted by sharing needles and injection drug use equipment [1,22]. The opioid epidemic in the U.S., particularly the rise in injection drug use (IDU), is associated with an increase in risk of contracting bloodborne illnesses like HCV [23]. In fact, between 2010 and 2015, HCV incidence increase threefold due primarily to opioid-related IDU [23].

The USPSTF revised its HCV screening guidelines to include all adults aged 18–79 due to an increase in risk behaviors (e.g., injection drug use) and a rise in HCV infection among younger individuals [2,5,24,25]. However, screening rates remain low. Data from community health centers indicate a national screening rate of 8.3%, whereas data from the National Health Interview Study indicate a 17.3% screening rate [2].

## 2. Purpose

Amid national underscreening, a rise in IDU driven by the opioid epidemic, and increases in HCV infection among younger individuals, there is a need to ramp up screening efforts and to understand the screening behaviors and attitudes of high-risk individuals. Despite an understanding that HCV disproportionately affects individuals experiencing homelessness, there remains a gap of knowledge about how to improve screening among this population because many nationally representative surveys do not sample individuals experiencing homelessness (e.g., NHANES interviews noninstitutionalized civilians and conducts home interviews, excluding individuals experiencing homelessness) [26]. Goals to eliminate and reduce the spread of HCV remain elusive due to challenges in reaching and diagnosing high-risk populations [27]. To address this gap and the current need, this phenomenological thematic analysis investigated the barriers and facilitators to HCV screening from the perspective of unsheltered individuals experiencing homelessness within a non-residential social service setting.

## 3. Theoretical lens

The philosophical underpinnings of the present study relied primarily on the theories of social constructivism and social constructionism. Social constructivism and social constructionism are common approaches to qualitative inquiry and analysis, and they posit that lived experiences are in themselves a way of knowing, as opposed to “a factual record of what ‘really’ happened” [28]. Social constructivism refers to the knowledge created as a result of social interactions between people and groups, while social constructionism centers on the things created as a result of social interaction between people or groups [29]. Social constructionism and social

constructivism are both ways of understanding knowledge and truth, and that knowledge and truth can create systems and cultural norms that affect the decisions individuals make about their health.

## 4. Methods

### 4.1. Design

This thematic analysis was conducted in order to understand the challenges and facilitators to HCV screening among individuals experiencing homelessness. In alignment with the aforementioned theoretical lens and research objective, this study prioritized the lived experiences of participants, thus employing a descriptive phenomenological approach to the overall study design and data analysis. This methodological approach places emphasis on the direct, first-hand of experiences of individuals in order to understand phenomena [28].

### 4.2. Setting

Individuals experiencing homelessness at two social service organizations in Houston, Texas, were invited to participate in the study during August 2020. Services provided at these organizations included meals, showers, and healthcare linkages to HCV screening through a co-located Federally Qualified Health Center (FQHC).

The combined cases from 9 states (including Texas) make up more than 50% of the HCV cases in the U.S. [30]. It is estimated that more than 25% of Texans are at risk, and over 584,196 Texans have chronic HCV [22]. Since 1990, HCV mortality has increased by 71% in men and 29% in women [22]. The highest proportion of HCV cases in Texas are located in (or near) major cities, such as Houston [31].

### 4.3. Recruitment

Individuals were approached while seeking services at participating organizations. The inclusion criteria prioritized individuals aged 18 years and older and fluent in English. Individuals under the age of 18 and individuals who were not fluent in English were excluded. Recruitment took place during the second major surge of the COVID-19 pandemic, and as a result, safety precautions were taken to ensure the safety of participants. Precautions included social distancing, participant temperature checks, the use of masks by both researcher and participants, and the sanitizing of work spaces and equipment.

### 4.4. Data collection/analysis

Participants completed a brief demographic survey and a semi-structured interview. Verbal informed consent was acquired from each participant following a thorough explanation of the study. Participant interviews took place in a semi-private, quiet space at each of the participating organizations. Interviews lasted approximately 45 min, and were conducted by Author 1, who also maintained meticulous field notes and a reflexive research diary. Participants received \$20 and a hygiene kit for their participation. An interview guide was used in the conduct of the semi-structured interview. Data were collected until saturation was reached, which was determined to have occurred when no new overarching sub-topics or themes emerged from the interviews [32]. Data saturation was assessed in the data collection phase by listening to and reviewing audio-recorded interviews daily and identifying informational redundancy prior to coding [33]. Additionally, an effort was made to recruit a diverse population within the two participating organizations in order to ensure that no potential themes were missed [33].

Survey data were cleaned in Microsoft Excel, and descriptive statistics were calculated using SPSS Statistics Version 25 [34,35]. Audio-recorded interviews were professionally transcribed. Transcripts were uploaded to ATLAS.ti 8 for preliminary content analysis prior to coding [36,37]. To develop a codebook, a subset of transcripts was printed and coded by hand for

distinct themes based on the meaning of participants' words and phrases [36]. A codebook was developed based on this preliminary coding process, and this codebook was used to code the remaining transcripts. An analysis of dominant topics within the codes resulted in the identification of major themes. The themes most frequently mentioned and recurring in participant narratives were included in this manuscript. The development of the codebook, coding, and thematic analysis were completed by Author 1.

This study was approved by the University of Texas Health Science Center at Houston (UTHealth) School of Public Health Committee for the Protection of Human Subjects (IRB). It was funded through a dissertation research award from the Health Policy Research Scholars (HPRS), a leadership development program of the Robert Wood Johnson Foundation.

**Table 1**  
Demographic characteristics of study sample and prior engagement with Hepatitis C screening and education.

	(%)	(n)
Gender		
Female	19.4%	6
Male	80.6%	25
Racial/Ethnic Identity		
Asian	3.2%	1
Black or African American	74.2%	23
Hispanic/Latinx	6.5%	2
White	9.7%	3
More than one racial/ethnic identity	6.4%	2
Education		
Grades 1 through 8	6.5%	2
Grades 9 through 11	29.0%	9
Grades 12 or GED	35.5%	11
Some college, Associate's Degree, or Technical Degree	16.1%	5
Bachelor's Degree	9.7%	3
Any post graduate studies	3.2%	1
Employment Status		
Employed full-time	6.5%	2
Employed part-time	16.1%	5
Retired	16.1%	5
Unable to work for health reasons	19.4%	6
Unemployed	38.7%	12
Other	3.2%	1
Insurance Status		
Yes (Medicaid, Medicare, Private Insurance)	32.3%	10
No	38.7%	12
Other (Gold Card, Texas Health Women, etc)	29.0%	9
Where Participant Slept Previous Night		
Emergency shelter, hotel, or motel (paid with voucher)	3.2%	1
Hotel or motel paid for without emergency shelter voucher	6.5%	2
Long-term care facility or nursing home	3.2%	1
Place not meant for habitation (e.g., street)	61.3%	19
Rental by client, with no housing subsidy	6.5%	2
Staying or living in a friend's room, apartment, or house	19.4%	6
Lifetime HCV Testing		
Yes	67.7%	21
No	25.8%	8
Unsure	6.5%	2
Most Recent HCV Test		
Less than 12 months ago	29.0%	9
1–2 years ago	16.1%	5
More than 2 years ago	22.6%	7
Don't know/declined	6.5%	2
Never been tested	25.8%	8
Result of Most Recent HCV Test*		
Positive	21.7%	5
Negative	60.9%	14
Never obtained results	17.4%	4
Lifetime HCV Education/Enformation		
Yes	48.4%	15
No	45.2%	14
Unsure	6.5%	2

\* Eight participants are excluded from this data because they had never been tested for HCV.

## 5. Results

### 5.1. Participant characteristics

Thirty-one individuals experiencing homelessness were interviewed (Table 1). The mean age of participants was 57 years (range: 22–71 years, median: 64 years). Almost half of participants ( $n = 15$ , 48%) were 65 years old and older. Participants reported long-term homelessness, with 38% ( $n = 12$ ) reporting experiencing homelessness for 1–5 years. More than half indicated that they spent the previous night at a place not meant for habitation (e.g., the street) ( $n = 19$ , 61.3%). Over a third had been seeking services at the organizations for more than 4 years ( $n = 11$ , 35.5%).

The majority of participants identified their gender identity as male ( $n = 25$ , 80.6%), and most also self-identified as Black/ African American ( $n = 23$ , 74.2%). Almost 40% had no medical insurance ( $n = 12$ , 38.7%). 50% of participants aged 65 and older were insured, while only 13% of participants between 18 and 64 years were insured.

Most participants disclosed having been tested for HCV in the past ( $n = 21$ , 67.7%); however, many had been tested either 1–2 years ago ( $n = 5$ , 16.1%) or more than 2 years ago ( $n = 7$ , 22.6%) (Table 2). More than a quarter reported never having been tested for HCV ( $n = 8$ , 25.8%). A majority of participants previously tested for HCV shared that their most recent results were negative ( $n = 14$ , 60.9%), but a few participants disclosed that they were HCV positive ( $n = 5$ , 21.7%).

### 5.2. Thematic analysis

Participants identified the following barriers to HCV screening: lack of access to HCV screening, mistrust of the healthcare system and professionals and lack of knowledge of HCV prevention, harm reduction, and complications. Additionally, participants identified the following facilitators to HCV screening: providing incentives and increasing access and convenience to HCV screening.

**Barrier: Lack of Access to HCV Screening.** Participants faced substantial structural barriers that prevented them from accessing both general healthcare and HCV screening. They lacked access to health insurance, endured long wait times at clinics, and faced challenges with transportation. As Participant 31 (Male, Age 65–74) put it,

It's easy for me, like I said, 'cause I got that VA. I can go follow that and they're going to take care of me. But I've noticed for a lot of peoples out here homeless, it's not easy.

Lack of transportation and long wait times at clinics were also noted as major barriers to HCV screening. Participant 23 (Male, Age 65–74) shared, "It's rough because I don't have the means of transportation. You got have to have transportation." Some participants noted that spending all day at a clinic (e.g., due to long wait times) meant foregoing meals they receive at local organizations and going hungry. As Participant 7 (Male, Age 55–64) stated,

...Like I said, I'm not gonna sit in no clinic all day to get tested. You know, you're gonna come out. You're gonna give vaccines to people, but you only got one person in the clinic and administering it. So that means you got to sit there all day. And if you ain't got no money or no food or nothing, but you got to sit in the clinic all day, by the time you get out the clinic to go try find some food, it's too late. So you going to sleep hungry. That's why I know most people don't want to come to the clinic because they don't want to sit in there all day...

**Barrier: Mistrust of the Healthcare System and Professionals.** Fear and mistrust of the healthcare system and healthcare professionals was identified as a barrier for HCV screening. Specifically, participants expressed fear of abuse and harm, fear of needles, fear of getting bad news, and lack of confidence in the abilities of healthcare professionals. Participant 9 (Male, Age 65–74) recalled being discouraged from seeking HCV screening,

... when you go in and you say that, "I wanna be tested for hepatitis," for some reason, instead of them being thankful that you wanna know, the impression that you get from them, a lot of them, is that, "Here comes

**Table 2**  
Selection of participant quotes by theme.

	Theme	Respondent characteristics	Quote
Barrier	Lack of Access to HCV Screening	Participant 19, Male, Age 55–64 Participant 7, Male, Age 55–64	Oh, my God. Like I say, boy, I wanna walk out. You know, you gotta wait so long. When you don't have no money you– I mean, I– There ain't nothing else I could do. ...if they're out on the street, and they do get tested, they can't get the results right then and there, it'll be hard for them [the clinic] to find them [individuals experiencing homelessness] to get the results. See what I'm saying? And ain't nobody wanna come back and sit up in the clinic just to get results. Sit up here all day long to find out their results. Or either if they got a phone, which most people do, but they– Most people lose their phones on the street or get 'em stolen. So even if you gave– If they gave you the phone number, you could not get in touch with them. So that's a problem.
		Participant 13, Male, Age 65–74	The hardest thing about homelessness that I found out is it- it's hard getting bus transportation. It's just one of the hardest things there is because it seems like they have the mindset that you're homeless because you're not doing what you need to do for yourself...
Barrier	Mistrust of the Healthcare System and Professionals	Participant 14, Male, Age 65–74 Participant 10, Male, Age 65–74	...the medical community, it doesn't know enough about certain things to let them know that for sure... And then if I wouldn't never let them mess with me, then I'd be all right I don't believe in health care. I mean, I believe in it but it ain't for me. I'm from the country and I don't even take medication. I've never had high blood pressure. I've never had no serious illnesses... I see what other people have been going through. Being mistreated, being denied. So, I don't wanna go where I know I'm gonna be denied and majority of people that are out here ain't nobody cares about them.
		Participant 6, Male, Age 25–34 Participant 12, Male, Age 65–74	My experience [with healthcare providers] has been kind of difficult, because a lot of people turn their noses up to me 'cause of my skin color... ...I mean, here's a theory in medicine as well...the people that are here [community clinic] are basically learning and trying to gather experience as opposed to those that are in the [name of large hospital system] systems. So these people are learning. Therefore, mistakes will be made and then it's just, "Oops, I'm so sorry. Uh, next patient, please."
		Participant 7, Male, Age 55–64	Oh, yeah. Kind of like drinking at the same bottle, like smoking cigarettes. It gets most spread like that. Especially when somebody wanna give you a cigarette and the filter's wet. So if that's not bodily fluids, I don't know what is, you know. And if you can sit out here and watch how many people pass cigarettes back and forth...
Barrier	Lack of Knowledge of HCV Prevention, Harm Reduction, and Complications	Participant 2, Female, Age 25–34 Participant 8, Male, Age 55–64	I don't know, they didn't tell me too much about it. They [Doctors] tell me that I was probably Hepatitis positive, but they don't tell me too much about it. [Regarding risk reduction strategies] I smoke by myself; I drink water by myself...
		Participant 12, Male, Age 65–74	Well, I don't do intravenous drug use, I don't do homosexuality, I don't drink behind people. So, I basically stay to myself.
		Participant 3, Male, Age 45–54 Participant 4, Male, Age 25–34 Participant 17, Male, Age 55–64 Participant 3, Male, Age 45–54	Yeah because I'm homeless, I need things. Maybe they say, "Well, see here's a coupon or gift card, hot meal or, maybe go to Walmart." These things that I need. Yeah-yeah-yeah I'd do it then, yeah. Find a motive. Find some bait. Gonna have to have some cookies or put some money or something like. Find a motive or find a– "You gonna get this if you do this." Excuse me, and this is bad to say and I hope you'll forgive me. It seems like the only thing that again, you know, will get them here some kind of, you know, something that benefits them. Honestly, if you offer them something like cash bonus, maybe a McDonald's coupon. Something that would give them interest into doing it, but just doing it, just doing it randomly? No. No, it ain't gonna happen.
Facilitator	Providing HCV Screening Incentives	Participant 12, Male, Age 65–74 Participant 7, Male, Age 55–64 Participant 20, Male, Age 55–64	If it was offered and scheduled at a facility...Hep C testing every certain days like HIV in certain days. If there was a certain scheduled day for it, sure, they'd go...I don't know about here, but there are places that there are posters, the first of the month, third days during the month, there is HIV testing. ...a van that pulls up or a bus that pulls up the way they was doing the HIV testing. Instead of them have to come sit in the clinic all day. ...have some workers and you have to pay them not just voluntarily...Let them do the work. You have a general homeless housing, you have a outreach people sometimes...you need Hepatitis testing people. Go on the street four or five in a van, get them tested...And that's where you can help them.
		Participant 28, Male, Age 65–74	Tell them about it, offer it to them, you know, I'm doing hepatitis C test, anybody wanna get tested come out here and over, bring it, bring it over. Hepatitis C is being spread around, anybody wanna test?

somebody who wanna waste my time and be tested for hepatitis, and I wish that they didn't ask to be tested." And like, you know, that falls on me. Here's a person that wanna know... but when he asks to be tested, the agency that will be testing him, in a way, is reluctant to test him. And so, you know, it confused me.... Sometimes, they will try to discourage you from taking it. Like, "Is it absolutely necessary?"

Others expressed mistrust in the abilities of healthcare professionals and in the screening procedure. Participant 12 (Male, Age 65–74) stated that his concerns include, "the procedure, the person doing it, the needle itself, the gloves, you know... not everybody that's supposed to know what they're doing knows what they're doing." Some participants were particularly uncomfortable with the fact that HCV screening entails a blood draw. Participant 6 (Male, Age 18–24) shared that, "Just knowing they're gonna be

stabbed by a needle. The needle. I'm not touching no needle, I barely got tested, I don't like needles either."

Fear of knowing one's results and being deliberately infected with HCV by healthcare professionals was also a concern. Regarding his and others' fears of knowing their HCV status, Participant 14 (Male, Age 65–74) shared, "...it's scary to them. They know that they've been at risk, they know they put themselves there. And, I've been in that boat too... It's almost like playing a Russian roulette with themselves..." Participant 14 elaborated, "...sometimes people have a mistrust, some people that have been raised old fashioned and have a mistrust with the medical profession. They feel like.... they might have gave it to me or something."

**Barrier: Lack of Knowledge of HCV Prevention, Harm Reduction, and Complications.** Overall, participants discussed and displayed a lack of

knowledge of HCV prevention, harm reduction, and complications associated with HCV. Some participants shared that the topic of HCV does not regularly arise during clinic visits, and many did not recall ever discussing HCV with a healthcare provider. As Participant 13 (Male, Age 65–74) stated,

...I swear to God, I've been here, I don't know how many times, it never came up. Everything else did. They screen your blood for this, this, this, this, this but hepatitis, no...it's like a lost deadly thing.

Participants were asked to share any knowledge of HCV or anything they had heard about the illness, since much of the knowledge among individuals experiencing homelessness is disseminated by word-of-mouth. Some of the information was inaccurate, and likely conflated with protection guidelines for COVID-19. Participant 7 (Male, Age 55–64) shared the following,

...you can get it through getting tattoos. You can catch it from somebody coughing. I don't know if you can catch it by touching anybody, but them are all about the only things I know...

Other participants mentioned protective behaviors commonly associated with those that are protective against COVID-19, for which there is a great deal of messaging and information in the community because this study was conducted during the COVID-19 pandemic. For instance, Participant 2 (Female, Age 25–34) stated, "I don't know, to mask up? Mask up, and just not be rude to them, but just kinda keep your distance. Don't share drinks and food with them. Keep your distance..."

Several participants were actively engaged in risk behaviors for HCV, but had little knowledge about HCV risk factors and how to adequately protect themselves. When asked about what he does to protect himself from HCV, Participant 8 (Male, Age 55–64) stated, "...I drink beer by myself, I smoke my own cigarettes by myself. Honest, I've heard that you can catch hepatitis from drinking, smoking cigarettes with somebody else." Similar responses about not sharing food and drink were very common when discussing protective behaviors against HCV.

*Facilitator: Providing HCV Screening Incentives.* Overall, participants mentioned incentives as a strategy to encourage participation in HCV screening. HCV screening incentives mentioned by participants included gift cards, a meal, or monetary incentives. Providing incentives is a strategy to help organizations learn about the HCV status of clients, and it can encourage clients with urgent survival needs to seek HCV screening. Participant 9 (Male, Age 65–74) shared,

...a person that's homeless and who don't have a lot of financial resources or capital, he's not concerned about taking time out to go and get tested with hepatitis or anything else...if these organizations who really wanna know who might be walking around with hepatitis, if they were to offer some kinda incentive, financial incentive to make the person with it wanna come be tested.... that would encourage them to go to be tested.

Individuals experiencing homelessness have a wide range of urgent survival needs as well as a lack of resources that limits their ability to travel to access HCV screening. Fulfilling survival needs with modest incentives may encourage this high-risk, high-need population to seek HCV screening.

*Facilitator: Increasing HCV Screening Access and Convenience.* When asked how community organizations with co-located FQHCs can best promote HCV screening for individuals experiencing homelessness, participants provided suggestions that can be adequately categorized as increasing both access and convenience to HCV screening. Some of these strategies included offering HCV screening on a regular schedule (e.g., third Thursday of the month), increasing HCV screening frequency (e.g., more than once per year), community outreach, and mobile testing.

Drawing on the number of urgent needs of individuals experiencing homelessness, some participants expressed that HCV screening needed to be made more visible in the community. As Participant 30 (Male, Age 65–74) put it, "...if you had to take a big bus out here and people can just get tested, and go in through there one at a time..." A mobile unit in places where individuals experiencing homelessness gather may eliminate barriers around transportation and long wait times.

## 6. Discussion

The present study adds to the growing body of literature around HCV screening among individuals experiencing homelessness. As a barrier to HCV screening, participants cited a lack of access to HCV screening, mistrust of the healthcare system and professionals, and a lack of knowledge of HCV prevention, harm reduction, and HCV complications. As facilitators to HCV screening, participants mentioned that providing incentives would encourage individuals experiencing homelessness to undergo HCV screening. Participants also mentioned other strategies to increase HCV screening access and convenience as facilitators, including offering HCV screening on a set schedule and mobile testing.

### 6.1. Barriers

Participants reported significant structural barriers that prevented them from accessing HCV screening, including being uninsured, long wait times at clinics, and lack of access to transportation to get to clinics and medical appointments. Their experiences align with the findings of previous studies reporting that individuals experiencing homelessness and engaged in substance use seldom show up to follow-up appointments for HCV screening and related care if such care requires transportation and travel [20,21]. In fact, providing transportation has been previously reported as a facilitator to HCV screening among individuals experiencing homelessness and individuals engaged in substance use [17,18]. Similarly, long wait times has been previously reported as a barrier for people experiencing homelessness and engaged in substance use [19].

Participants reported a mistrust of the healthcare system and professionals. Some participants shared previous negative experiences, including concerns about being deliberately infected with HCV by healthcare professionals. Additional concerns related to HCV screening mentioned by the participants included fear of needles and fear of getting bad news, which, in this case, would be a positive HCV diagnosis [19]. Lack of knowledge of HCV and related complications prevented adequate harm reduction and self-protection, and made participants feel that HCV was not as important as illnesses they hear more often about, such as HIV. This finding is consistent with that of previous studies in which participants have similarly expressed a lack of knowledge of harm reduction strategies to prevent HCV [17]. Because of regular engagement in high-risk behaviors and infrequent HCV testing, participants were unaware of their most recent HCV status [5].

In addition to these challenges, misinformation about HCV transmission directly affected how participants behaved in order to protect themselves against it. Thus, providing HCV information can allow individuals, especially those engaged in high-risk behaviors, to adequately protect themselves and others and to seek out screening to be made aware of their status. Providing information is also critical to elevating the importance of HCV screening.

### 6.2. Facilitators

Providing incentives was mentioned as a strategy to increase HCV screening among individuals experiencing homelessness. Previous studies have found that monetary incentives were facilitators to HCV screening [17,18]. Strategies to increase convenience and access to HCV screening were also mentioned by participants. Mobile testing, specifically, can eliminate the need for transportation [18,20,21]. Lack of transport and long wait times are mentioned repeatedly in the literature, as well as by participants of this study, as barriers to seeking HCV screening [17,18,19,20,21]. To reduce wait times and the need for follow-up appointments (which are made difficult due to lack of transport), organizations should consider providing rapid testing [18]. Previous studies show that having prior experiences with rapid testing is a facilitator to HCV screening [17,18]. It may also minimize fear of needles, reduce wait times, and decrease transportation costs, all of which were mentioned as barriers by study participants.

### 6.3. Limitations

The present study has several limitations. For one, the transferability of this study might be limited, and this study's findings might not be applicable to other organizations and geographic locations. Some of the practices to increase the trustworthiness and credibility of qualitative research (e.g., member checks) were not utilized in the conduct of the present study. Additionally, participant recruitment, data collection, and coding were carried out by one member of the research team, which may introduce bias. This study took also place during the second major surge of the COVID-19 pandemic, at a time during which many organizations and communities were enforcing distancing and participants were only visiting organizations for essential services, for shorter periods of time, and more infrequently than usual. These conditions may have created new barriers and/or exacerbated existing barriers to HCV screening. To mitigate these challenges, the research team member engaged in data collection and coding utilized a reflexive research diary and kept field notes, strategies which help identify and minimize researcher bias and also serve as an audit trail to document the process.

This study is also limited by its setting and population, as speaking to individuals at homeless service providers in an urban setting may exclude individuals who are disengaged from community-based organizations and healthcare services and who reside in rural locations. These individuals may be at highest risk and have different needs and experiences than individuals who are connected to services. Further, while an effort was made to recruit a diverse sample, most participants identified as Black/African American. This aligns with the fact that, resulting from a long legacy of systemic racism, Black/African Americans are overrepresented among people experiencing homelessness, accounting for 39% of individuals experiencing homelessness in the U.S. despite the fact that they represent 13% of the U.S. population [9,39]. Other racial and ethnic groups may have different needs and experiences than those expressed by the majority of the participants in the present study. Due to its qualitative and exploratory design, analyses of differences and comparisons between individuals were not carried out, and these may have provided a more robust analysis of barriers and facilitators to HCV screening.

In spite of these limitations, this study provides a qualitative overview of barriers to HCV screening faced by individuals experiencing homelessness, as well as facilitators to improve their participation in community-based HCV screening programs. This is a major strength of this study because there is a dearth of qualitative research on the barriers and facilitators to HCV screening among individuals experiencing homelessness [19]. Though the HCV literature is robust, much of it is not specific to homelessness and is primarily quantitative, focused on reporting screening, treatment, and infection rates e.g., [4,19,38].

### 7. Practice and programmatic implications

This study identified barriers to HCV screening faced by individuals experiencing homelessness, as well as facilitators to improve screening among this hard-to-reach, marginalized population. HCV screening programs for people experiencing homelessness should consider moving screening efforts and other preventive services from clinical settings to social service settings and organizations in the community in order to ameliorate medical mistrust and meet people where they are. Community-based HCV providers should consider providing incentives, transportation, mobile testing, scheduled screening, and rapid testing. Moreover community-based providers looking to increase HCV screening should provide harm reduction information and HCV screening information to combat misinformation, encourage screening, and prevent HCV morbidity and mortality.

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### Author contributions

All authors contributed to the study conception and design. Material preparation, data collection and analyses were performed by Author 1. Authors 2, 3, and 5 supported the conceptualization, methodology, provided supervision, validation, and supported the writing of the original and subsequent drafts of the manuscript. Author 4 supported the conceptualization and assisted with writing and editing of the manuscript. The first draft of the manuscript was written by Author 1 and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

### Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the University of Texas Health Science Center at Houston (UTHealth) School of Public Health Committee for the Protection of Human Subjects (IRB).

### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

### Declaration of Competing Interest

The authors have no relevant financial or non-financial interests to disclose.

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### Appendix A Demographic Survey

Name of Site: \_\_\_\_\_.

Date: \_\_\_\_\_.

1. How old are you? \_\_\_\_ Years
2. What is your gender?
  - Male
  - Female
  - Transgender Male/Trans Man/ Female-to-Male (FTM)
  - Transgender Female/Trans Woman/ Male-to-Female (MTF)
  - Genderqueer, neither exclusively male nor female
  - Additional Gender Category/ (or Other), please specify: \_\_\_\_\_
  - Choose not to disclose
3. What is your sexual orientation? [Select all that apply]
  - Straight or heterosexual
  - Lesbian, gay, or homosexual
  - Bisexual
  - Something else \_\_\_\_\_
  - Don't know
  - Choose not to disclose
4. How would you describe your racial/ethnic identity? [Select all that apply]
  - White [German, Italian, Irish, Polish, English, French]
  - Hispanic/Latinx, or Spanish [Mexican or Mexican American, Salvadoran, Puerto Rican, Dominican, Cuban, Colombian]

- o Black or African American [African American, Jamaican, Nigerian, Ethiopian, Haitian, Somali]
  - o Asian [Chinese, Filipino, Korean, Vietnamese, Asian Indian, Japanese]
  - o American Indian or Alaska Native [Navajo Nation, Blackfeet Tribe, Mayan, Aztec]
  - o Middle Eastern or North African [Lebanese, Syrian, Iranian, Moroccan, Egyptian, Israeli]
  - o Native Hawaiian or other Pacific Islander [Native Hawaiian, Tongan, Samoan, Fijian, Chamorro, Marshallese]
  - o Other: \_\_\_\_\_
5. What is the highest level of education you completed?
- o Never attended school
  - o Grades 1 through 8
  - o Grades 9 through 11
  - o Grades 12 or GED
  - o Some college, Associate's Degree, or Technical Degree
  - o Bachelor's Degree
  - o Any post graduate studies
6. What best describes your employment status? Are you:
- o Employed full-time
  - o Employed part-time
  - o A homemaker
  - o A full-time student
  - o Retired
  - o Unable to work for health reasons
  - o Unemployed
  - o Other
7. [If Employed in Q6] What is your monthly income?
- o 0 to \$417
  - o \$418 to \$833
  - o \$834 to \$1041
  - o \$1042 to \$1250
  - o \$1251 to \$1667
  - o \$1668 to \$2082
  - o \$2083 to \$2500
  - o \$2501 to \$2916
  - o \$2917 to \$3333
  - o \$3334 to \$4167
  - o \$4168 to \$4999
  - o \$5000 to \$6250
  - o \$6251 or more
8. Have you ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard?
- o Yes, now on active duty
  - o Yes, on active duty during the last 12 months, but not now
  - o Yes, on active duty in the past, but not during the last 12 months
  - o No, training for Reserves or National Guard only
  - o No, never served in the military
9. How long have you been homeless this time? Only include time spent staying in shelters and/or on the streets.
- o Years: \_\_\_\_
  - o Months: \_\_\_\_
- o Weeks: \_\_\_\_
  - o Days: \_\_\_\_
10. Which of the following most closely matches where you slept last night?
- o Place not meant for habitation (i.e., street)
  - o Emergency shelter, including hotel or motel paid for with emergency shelter voucher
  - o Staying or living in a friend's room, apartment, or house
  - o Staying or living in a family member's room, apartment, or house
  - o Hospital or other residential non-psychiatric medical facility
  - o Long-term care facility or nursing home
  - o Jail, prison, or other detention facility
  - o Psychiatric hospital or other psychiatric facility
  - o Substance abuse treatment facility or detox center
  - o Residential project or halfway house with no homeless criteria
  - o Transitional housing for homeless persons
  - o Hotel or motel paid for without emergency shelter voucher
  - o Hotel or motel paid for without emergency shelter voucher
  - o Permanent housing for formerly homeless persons
  - o Rental by client, with no housing subsidy
  - o Owned by client, no ongoing housing subsidy
  - o Owned by client, with ongoing housing subsidy
11. How long have you been seeking services at (Name of Organization)?
- o Less than 6 months
  - o 7 months- less than 2 years
  - o 2 years, less than 4 years
  - o More than 4 years
12. Do you currently have health insurance coverage? This includes Medicaid or Medicare.
- o Yes (Medicaid, Medicare, Private Insurance)
  - o No
  - o Other (Gold Card, Texas Health Women, etc): \_\_\_\_\_
13. Have you ever been tested for hepatitis C?
- o Yes
  - o No
  - o Unsure
14. When was the most recent time you were tested for hepatitis C: less than 12 months ago, 1–2 years ago, or more than 2 years ago?
- o Less than 12 months ago
  - o 1–2 years ago
  - o More than 2 years ago
  - o Don't know/ declined
15. What was the result of your most recent hepatitis C test?
- o Negative
  - o Positive
  - o Never obtained results
  - o Indeterminate
16. Have you ever received information or education around HCV?
- o Yes
  - o No
  - o Unsure

## Appendix B Interview Guide

Thank you for answering the demographic questions! Next, we will dive into the interview questions.

Date: \_\_\_\_\_ Site Name: \_\_\_\_\_

1. Tell me about your day. What does an average day look like for you? Where do you go and what do you do day-to-day?

Prompt: Tell me a little about who you see/interact with regularly/daily (could be related to the justice system, medical care, homeless services, friends, family). What does it mean to be a person experiencing homelessness? How do you see yourself in society?

2. Tell me about your past and current experiences trying to get any medical care or treatment, HCV-related or other medical care/treatment.

Prompt: What do you learn about yourself (and your position in society) from these interactions and experiences? What other agencies do you regularly come in contact with?

3. How important is HCV screening in your life? Is HCV screening a priority in your life? How does it rank/compete with other priorities/concerns in your life?
4. Tell me a little about what you know about Hepatitis C.
5. Hepatitis C is an infectious disease that causes inflammation of the liver, cirrhosis, and liver cancer. It is spread through sharing needles, sexual contact, and having contact with infected bodily fluids. What kind of things do you do to protect yourself from HCV?
6. What do you think prevents people experiencing homelessness from getting healthcare? HCV screening? What would you do to encourage people experiencing homelessness to get tested for HCV?
7. When you think about getting screened for HCV, how do you feel? Why do you feel that way?
8. What would be your main concerns with getting tested for HCV?
9. What kinds of things would encourage you to get tested for HCV?
10. What do you think of when you hear HCV? What are your first thoughts/-impressions when you come across someone with HCV?

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