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ORIGINAL PAPER

Knowledge, Attitudes, and Behaviors Related to Hepatitis C Screening and Treatment among Health Care Providers in Washington, DC

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Abstract

Elimination of chronic hepatitis C (HCV) will require scaling up treatment, including possible HCV treatment by primary care providers. The District of Columbia (DC) has a substantial population living with untreated hepatitis C, and treatment expansion would benefit the resident population. The aim of this study was to assess the knowledge, attitudes, and behaviors of primary care providers and specialists related to hepatitis C screening and treatment. We conducted a prospective, online survey of physicians and nurse practitioners (n = 153) in DC on their knowledge, attitudes, and behaviors related to hepatitis C screening and treatment, as well as referral patterns, interest in learning, and preferred learning modalities. We compared responses by provider type. Key findings indicated that HCV screening and treatment knowledge was higher among specialty physicians as compared to primary care providers. The most common reported facilitators of HCV screening included a prompt in the electronic medical record (63%), patient education (57%), and support staff (41%). While 71% reported that HCV treatment was important in the community they serve, only 26% indicated that access to HCV specialist expertise and consultation was a major area of need. Additionally, 59% reported that they refer all HCV patients to specialists for treatment. Primary care providers in DC had moderate interest in learning how to treat chronic hepatitis C, but they need additional training. Patients are typically referred to gastroenterology, infectious diseases, and hepatology specialists who may have limited capacity to expand treatment.

Keywords Hepatitis C screening · Hepatitis C treatment · Health care provider attitudes · Online survey

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Introduction

In the United States, there are an estimated 2.4 million people with chronic HCV infection [13]. Without treatment, chronic hepatitis C infection has a high risk of leading to cirrhosis of the liver, hepatocellular carcinoma, non-liver cancers, and the possibility of needing liver transplantation [1, 30, 33]. Prior to 2013, treatment for HCV included the use of injectable interferon, which was difficult to administer and associated with several adverse effects. Treatment of chronic hepatitis C (HCV) has become more effective, less toxic, and easier to take since 2013, when the first all-oral, direct-acting antiviral medications (DAAs) were approved by the US Food and Drug Administration [17]. Most interferon-free DAA regimens result in a sustained virologic response in over 90% of treated individuals in both randomized controlled trials [9, 28, 35]. Multiple interferon-free DAA regimens are now available for use, and many effectively treat multiple HCV genotypes [12]. Treatment for HCV has been associated with reduced mortality and reduced likelihood of development of hepatocellular carcinoma [4].

The World Health Organization (WHO) and National Academies of Science, Engineering, and Medicine (NASEM) have established goals for hepatitis C elimination by 2030 through prevention and treatment [24, 34]. In order to make progress towards those goals in the US, expanding the pool of treating providers is likely to be necessary [24]. In fact, in the US National Viral Hepatitis Plan 2017–2020, Strategy 2.1 is to "build the capacity of the health care workforce to diagnose viral hepatitis and provide care and treatment to persons infected with viral hepatitis" [32]. Primary care providers are well-positioned to screen and treat patients with chronic HCV, stemming from their first level of contact with diverse populations and longitudinal patient relationships. To be successful, however, they should have the knowledge and capacity to provide appropriate treatment [18].

In the pre-DAA era, HCV treatment was largely provided by specialists or tertiary care centers, but deliberate expansion into primary care has occurred in scattered practice settings throughout the US. For example, Project ECHO, a tele-monitoring network in which rural primary care providers consulted with HCV treatment specialists to gain knowledge and experience, aimed to increase HCV treatment capacity among primary care providers [2, 3]. Project ECHO was successfully replicated in other rural areas [5, 16, 20, 23, 26]. Despite a higher concentration of medical subspecialists in urban areas, a variety of primary care-based hepatitis C treatment models have been implemented in New York, NY, Bronx, NY, Atlanta, GA, and Cambridge, MA, as well as globally [6, 19, 21, 22, 29]. While these programs demonstrated successes, primary care treatment of HCV remained limited, due to the multidisciplinary needs, close follow-up, and intense symptoms associated with interferon-based regimens. With the availability of DAA regimens, there is now a unique opportunity for primary care providers to screen for and treat HCV. However, even in the post-DAA era, some reported barriers remain: inadequate reimbursement, difficulty in obtaining appropriate tests, limited knowledge, and lack of specialized staff to follow patients longitudinally [14].

Locally in the District of Columbia, between 2014 and 2018, DC Department of Health reported that 16,375 (2331 cases per 100,000 population) individuals had laboratory evidence of a preexisting or newly diagnosed chronic HCV infection. Of the cases that were RNA confirmed (76%), only 24% had a non-detectable HCV RNA based on their last documented laboratory report [8]. Consistent with WHO and NASEM guidance, the DC Department of Health has promoted HCV elimination, thus demonstrating a need to understand provider capacity to treat the remaining viremic individuals. Expanding HCV screening and treatment to the primary care setting may be one way to address this need. In DC, physicians, nurse practitioners, and physician assistants may prescribe DAAs for treatment of HCV, and the ASCEND trial demonstrated that treatment of HCV by primary care physicians and nurse practitioners in DC was as effective as treatment by specialists [15]. The DC Medicaid programs have gradually lifted restrictions on the use of DAAs for treatment of HCV, but some remain. Framed within the local context, we sought to understand the current state of knowledge, attitudes (including barriers), and behaviors of DC providers around HCV screening and treatment by conducting an online survey of health care providers in DC, and how these may differ between provider types.

First, we assessed knowledge related to HCV screening and treatment. Second, we assessed the extent to which (1) patient factors (limited knowledge or demand for treatment, comorbidities); (2) provider factors (limited capacity, lack of treatment knowledge, reluctance to treat people with historical or current substance use disorders); or (3) structural factors (barriers to accessing care with treating providers, cost of treatment, barriers from third-party payers) affected providers' perceptions of HCV treatment. Third, we assessed the level of interest in learning more about HCV screening and treatment, and preferred learning modalities. The results from this study may help identify areas of training and capacity building for expanding HCV treatment in DC.

Methods

Survey

We conducted a survey of health care providers in DC who were potential HCV screeners and providers to understand their knowledge, attitudes, and practice behaviors related to HCV screening and treatment.

Inclusion Criteria

The inclusion criteria was being a licensed nurse practitioner, physician assistant, or primary care or specialist physician (including infectious diseases, gastroenterology, and hepatology) whose clinical practice included adult patients in DC.

Recruitment

We recruited participants via email through distribution lists at the Health Regulation and Licensing Administration of the DC Department of Health and the DC chapter for the American Academy of Family Physicians. Potential participants were sent an email containing information that introduced the study, the survey link, and the option to receive a $10 digital gift card to Starbucks® after completing the survey. After clicking the link to the survey, potential participants reviewed the consent statement and agreed to it before proceeding to the survey. In March 2018, through the DC Department of Health distribution, the survey was distributed by email and remained open for one week.

Data Collection

After providing consent, participants anonymously completed a 76-item survey using the DC Department of Health instance of REDCap [10, 11]. REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies, providing (1) an intuitive interface for validated data capture; (2) audit trails for tracking data manipulation and export procedures; (3) automated export procedures for seamless data downloads to common statistical packages; and (4) procedures for data integration and interoperability with external sources. After completing the survey, they could submit their name and contact information to an administrative assistant to receive a $10 gift card; however, names were not linked to survey responses.

The survey included a combination of multiple choice, short-answer, Likert scale, and rank order questions. Survey questions were largely based on previously published studies [9, 27, 31]. Topics covered by the survey included: (1) demographic information (race, ethnicity, gender), (2) training background (provider type, years in clinical practice), (3) clinical practice information (type and size of practice, location of practice), and (4) knowledge, attitudes and practice patterns regarding HCV screening and treatment in DC. Two medical providers (1 physician, 1 nurse practitioner) at DC Department of Health piloted the survey and reported that the time for completion was approximately 15 min.

Outcomes

The primary outcome was a passing score for knowledge of HCV treatment. We asked nine (9) questions about HCV treatment and calculated a combined score (maximum score of 9). Respondents who correctly answered at least seven of the nine questions (78% or higher) were considered to have passing knowledge of HCV treatment.

Secondary outcomes were passing knowledge of HCV screening, high self-reported proficiency in HCV treatment, favorable attitudes towards treating HCV in the primary care setting, and interest in and preferences for future training in HCV treatment. We included four (4) questions about HCV screening and calculated a combined score (maximum score of 4). Respondents who correctly answered at least three of the four questions (75% or higher) were considered to have passing knowledge of HCV screening.

Self-reported HCV screening and treatment proficiency was based on a five-point Likert scale (none, limited knowledge/skills, average among my peers, very knowledgeable, and expert: can teach others). These responses were combined into dichotomous responses. Average, very knowledgeable, and expert were combined into a positive response, while none and limited were combined into a negative response.

Attitudes regarding the comfort level, professional benefits, and ideal providers of HCV treatment were assessed by a five-point Likert scale: strongly disagree, disagree, neutral, agree, and strongly agree. These responses were combined into dichotomous responses. Agree and strongly agree were combined into a positive response, and strongly disagree, disagree, and neutral were combined into a negative response. The specific questions that were asked can be found in Table 4.

Covariates

Provider demographic information included gender (male, female, transgender/non-binary), race (Asian, Black, White, Multiracial, Other), ethnicity (Latino/a or not), years in practice after the completion of training, number of patients with HCV, and provider and specialty type. Clinical site characteristics included clinic type, services provided, and whether or not it receives Ryan White funding. Knowledge questions focused on HCV risk factors, diagnosis, and general treatment modalities. Attitudes were assessed by a set of 10 Likert scale questions related to HCV treatment in specialty care versus primary care settings, personal interest in managing HCV, the impact treating patients with HCV has on the community, and comfort in discussing HCV risk factors with patients such as injection drug use. Another question set asked survey participants to rank five common reasons why patients do not receive HCV treatment in order of most important to least important.

Statistical Methods

We used SAS software, version 9.4, (copyright SAS Institute, Inc., Cary, NC, 2002–2012) to conduct statistical data analyses. We generated descriptive statistics to report frequencies and calculated chi-square p-values. We examined the primary and secondary outcomes by demographic factors (race/ethnicity and gender), clinical training factors (provider type and field of training, years in practice after training) and factors related to the primary outpatient practice setting (type of practice, funding from the Ryan White HIV/AIDS Program, and certification as a patient-centered medical home) to assess differences across groups.

Human Subjects Protections

Approval to conduct this study was granted by the institutional review boards at the DC Department of Health and George Washington University. To ensure anonymity, no identifiable information was collected that directly linked participants to their responses. Informed consent was obtained from all individual participants included in the study.

Results

The survey was sent to 10,413 physicians and physician assistants; of these, 121 physicians and no physician assistants completed the survey. The survey was sent to 1929 nurses, and 35 nurse practitioners completed the survey. The total number of respondents was 156. Of these, responses from 3 physician respondents were excluded because they identified themselves in a medical specialty that would be unlikely to conduct HCV screening or treatment as part of routine practice (1 ophthalmology, 1 anesthesiology, 1 cardiology). Thus, responses from 153 health care providers were included in the analysis. There was 1 OB/GYN respondent whom we classified as a primary care physician for the analysis, since OB/GYNs may conduct HCV screening. Of the 153 respondents included in the analysis, there were 35 nurse practitioners, 86 primary care physicians, 11 specialty physicians, and 21 physicians of unknown specialty. Demographic and clinical practice characteristics are shown in Table 1. Notable differences include gender (nurse practitioners and primary care physicians were predominantly women, whereas specialty physicians were predominantly men), race/ethnicity (more Asian respondents in the physician groups), and years in practice (nurse practitioners were more likely to have fewer than 5 years in practice compared to physicians).

Knowledge of HCV screening and treatment were examined by provider type and further stratified by years in practice (see Table 2). Specialty physicians demonstrated the highest knowledge scores for HCV screening and treatment compared to the other provider types. Respondents in practice for 5 years or more had higher knowledge scores when compared to those in practice for fewer than 5 years within the provider type, except for specialty physicians, which showed the opposite trend. However, there were only 2 specialty physicians in practice for fewer than 5 years.

There were no statistically significant differences in the reported facilitators and barriers to HCV screening by provider type or years in practice; thus we reported the aggregate results (Table 3). The majority (72%) reported no barriers to HCV screening. The few barriers reported included inability to remain current with HCV treatment guidelines (11%) and lack of resources or logistical support to screen patients for HCV (9%). A minority (16%) stated there were instances in which they elected not to screen a patient for HCV. Respondents most commonly reported that the following factors would facilitate HCV screening: screening prompt for at-risk patients in the electronic medical record (54%) and support staff to order screening for at-risk patients (41%).

For the most part, attitudes towards HCV treatment did not differ by provider type or years in practice; thus, we reported aggregate data (Table 4). The statements for which we found statistically significant differences by provider type included, “My developing capacity to treat HCV would benefit my clinic” (specialty physicians 73%, nurse practitioners 54%, primary care physicians 47%, physicians-unknown specialty 14%, $p = 0.01$), and “My participation in treating HCV does or would enhance my professional satisfaction” (specialty physicians 64%, nurse practitioners 43%, primary care physicians 40%, physicians-unknown specialty 10%, $p = 0.01$).

The reasons for referral to subspecialists, and the estimated duration of time that chronic HCV patients typically wait between referral and appointment with subspecialists, did not differ by provider type or years in practice; thus, we reported aggregate data (Table 5). Overall, 59% of respondents stated that they refer all HCV patients to specialists for treatment, but this was concentrated among primary care

Table 1 Demographic and clinical practice characteristics by provider type, District of Columbia 2018

	Nurse practitioners	Primary care physicians	Specialty physicians[*]	Physicians—unknown specialty
	No. (%)	No. (%)	No. (%)	No. (%)
Total	35 (100)	86 (100)	11 (100)	21 (100)
Gender[†]				
Men	3 (9)	32 (37)	7 (64)	9 (43)
Women	30 (86)	53 (62)	3 (27)	12 (57)
Transgender or non-binary	2 (6)	0 (0)	1 (9)	0 (0)
Race/ethnicity[‡]				
White	25 (71)	49 (57)	4 (36)	19 (90)
Asian	2 (6)	17 (20)	3 (27)	2 (10)
Black or African-American	6 (17)	12 (14)	2 (18)	0 (0)
Latino or Hispanic	1 (3)	4 (5)	0 (0)	0 (0)
American Indian or Alaska Native	1 (3)	0 (0)	2 (18)	0 (0)
Other (incl. Pacific Islander, Native Hawaiian, Multiracial)	0 (0)	3 (0)	0 (0)	0 (0)
Years in practice post-training[§]				
Fewer than 5	21 (60)	24 (28)	2 (18)	7 (33)
5 to 10	9 (26)	21 (24)	2 (18)	6 (29)
11 to 15	1 (3)	9 (10)	3 (27)	2 (10)
16 to 20	2 (6)	14 (16)	1 (9)	0 (0)
More than 20	2 (6)	18 (21)	3 (27)	6 (0)
Practice type[§]				
Private practice	10 (29)	21 (24)	2 (18)	4 (19)
Academic center	5 (14)	23 (27)	3 (27)	9 (43)
Public Health or Health Department	10 (29)	20 (23)	2 (18)	4 (19)
STD clinic	8 (23)	6 (7)	2 (18)	2 (10)
Federally Qualified Health Center	0 (0)	3 (3)	0 (0)	0 (0)
Hospital-based	0 (0)	0 (0)	1 (9)	0 (0)
Other	2 (6)	13 (15)	1 (9)	1 (5)
Ryan White funding received by the practice site				
No	15 (43)	46 (53)	5 (45)	11 (52)
Yes	8 (23)	6 (7)	3 (27)	1 (5)
I don't know	12 (34)	34 (40)	3 (27)	9 (43)
Patient centered medical home certification of the practice site				
No	15 (43)	41 (48)	4 (36)	14 (67)
Yes	20 (57)	45 (42)	7 (64)	7 (33)

[*] Specialty physicians include infectious diseases, gastroenterology, and hepatology

[†] Chi-square p-value < 0.001

[‡] Chi-square p-value < 0.01

[§] Chi-square p-value < 0.05

physicians (69%), nurse practitioners (49%), and physicians with unknown specialty (67%). Respondents most commonly referred HCV patients to infectious diseases specialists (38%), followed by gastroenterologists (31%) and hepatologists (27%). The most common reasons for referral were to determine if therapy is indicated (35%) and advanced disease (cirrhosis or end-stage liver disease, 29%).

The majority (59%) indicated interest in additional HCV training, and 71% preferred online modalities (Table 6). A higher proportion of nurse practitioners (76%), versus physicians (53%), indicated an interest in additional training on HCV. Nurse practitioners had a stronger preference for HCV sessions at conferences or continuing education workshops. Physicians were willing to invest less time in HCV training (40% indicated 1 h) versus nurse practitioners (33% indicated a full day, or 8 h).

Table 2 Knowledge of HCV screening and treatment by provider type, District of Columbia, 2018

	All respondents No. (%)	Nurse practitioners No. (%)	Primary care physicians No. (%)	Specialty physicians No. (%)	Physicians—unknown specialty No. (%)	Chi-square P-value
Number of respondents	153 (100)	35 (100)	86 (100)	11 (100)	20 (100)	
Average to expert self-reported proficiency*						
To identify appropriate patients for HCV screening	107 (70)	19 (54)	65 (76)	10 (91)	13 (65)	0.047
To treat HCV	53 (35)	10 (29)	29 (34)	10 (91)	4 (20)	0.0005
High knowledge scores						
HCV screening†	96 (63)	18 (51)	61 (71)	9 (82)	8 (38)	0.009
HCV treatment‡	13 (9)	1 (3)	6 (7)	6 (55)	0 (0)	< 0.0001

*Self-rated "average among my peers," "Very knowledgeable," or "Expert"

†HCV screening score: maximum score 9 points – reported as the proportion of the group with a score at least 7/9 or higher (high knowledge)

‡HCV treatment score: maximum score 4 points – reported as the proportion of the group with a score at least 3/4 or higher (high knowledge)

Table 3 Reported facilitators and barriers to HCV screening

	No. (%)
Total number of respondents	153 (100)
Facilitators of HCV screening	
Screening prompt for at-risk patients in the electronic medical record	96 (63)
Patient education	87 (57)
Support staff to order screening for at-risk patients at check-in	62 (41)
Automatic opt-out screening for patients in the electronic medical record	50 (33)
No intervention would be helpful	14 (9)
Barriers to screening for HCV	
No barriers	110 (72)
Unable to remain current with HCV treatment guidelines	17 (11)
Lack of resources or logistical support to screen patients for HCV	13 (9)
Difficulty in assessing if patient has already been screened for HCV	11 (7)
Concern about insurance coverage for HCV screening	10 (7)
Respondent reported there were instances in which they elected not to screen a patient for HCV	25 (16)
Among respondents who did not screen a patient for HCV, reasons why respondent did not screen for HCV	
Number of respondents who did not screen a patient for HCV	25 (100)
Did not have time	5 (19)
Did not know which test to order	3 (12)
Did not think the patient would be a candidate for HCV treatment	1 (4)
Did not think screening for HCV would improve outcomes	1 (4)

Discussion

The findings of the study demonstrated that specialty physicians had higher knowledge of HCV screening and treatment compared to primary care physicians and nurse practitioners. Reporting 5 or more years in practice was associated with higher knowledge scores for nurse practitioners and primary care physicians but not specialty physicians. A small minority (7–9%) stated that resources were a barrier to HCV screening. Only 16% reported there were instances in which they did not screen for HCV; this is lower than previously reported by Thomson and colleagues, in which one-third of primary care providers reported not screening for HCV despite known risk factors [31]. The majority of respondents (59%) indicated

Table 4 Health Care Provider Attitudes Regarding HCV Treatment

	No. (%)
Number of respondents	153 (100)
Statement	
I feel comfortable discussing ongoing HCV risk factors, including drug use, on a regular basis with my patients	117 (77)
HCV treatment is important in the community I serve	108 (71)
My developing capacity to treat HCV would benefit my clinic*	70 (46)
In the era of interferon-free direct acting antiviral regimens for treating HCV, treatment should continue to be provided primarily by specialists	60 (40)
My participation in treating HCV does or would enhance my professional satisfaction*	58 (38)
In the era of interferon-free direct acting antiviral regimens for treating HCV, treatment should be provided by primary care providers	53 (35)
Access to HCV specialist expertise and consultation is a major area of need for me and my clinic	39 (26)
Many of my HCV infected patients cannot adhere to treatment regimens	23 (15)
I would not initiate or refer for HCV treatment in a patient reporting active injection drug use	21 (14)

Data reported is for respondents who replied “Agree” or “Strongly Agree” to the statements below

*Chi-square P-value = 0.01 for comparison between provider types

Table 5 Provider attitudes and experiences with referrals for hepatitis C treatment

Question	No. (%)
Reasons for referral of a HCV patient to a subspecialist	
Number of respondents	153 (100)
Do not refer to subspecialists	12 (8)
Refer all patients*	91 (59)
To determine if therapy is indicated	54 (35)
Advanced disease (cirrhosis or end-stage liver disease)	44 (29)
Transplant consideration	29 (19)
Patient request	26 (17)
Medical comorbidities	25 (16)
Psychosocial comorbidities or concerns about compliance/follow-up	22 (14)
Ongoing risk factors for HCV exposure	19 (12)
Abnormal liver enzymes	18 (12)
Among respondents who refer chronic HCV patients to subspecialists, the types of subspecialists to whom HCV patients are referred most often	
Number of respondents who refer to subspecialists	133 (100)
Infectious diseases consultant	50 (38)
Gastroenterologist	41 (31)
Hepatologist	26 (27)
Non-specialist with HCV treatment experience	3 (2)
Other	3 (2)
Among respondents who have diagnosed HCV, the estimated duration of time that chronic HCV patients typically wait between referral and appointment with subspecialist	
Number of respondents who have diagnosed HCV	113 (100)
Less than 4 weeks	52 (46)
4 to 12 weeks	50 (44)
13 to 24 weeks	9 (8)
More than 24 weeks	2 (2)

*Chi-square P-value = 0.0008 for comparison between provider types

Table 6 Interest in and preferred learning methods for HCV screening and treatment education among physicians versus nurse practitioners

	All respondents No. (%)	Nurse Practitioners No. (%)	Physicians No. (%)
Interest in additional training			
Number of respondents	150 (100)	34 (100)	116 (100)
Indicated interest in additional HCV training*	88 (59)	26 (76)	62 (53)
Preferred learning methods for additional HCV training			
Number of respondents	153 (100)	35 (100)	118 (100)
Online modules/training	108 (71)	26 (74)	82 (69)
Sessions at conferences*	46 (30)	16 (46)	30 (25)
Local HCV workshop / CME training	59 (39)	16 (46)	43 (36)
Shadowing an experienced HCV provider in clinic	30 (20)	12 (34)	18 (15)
Continued case discussion with providers treating HCV in my community	33 (22)	9 (26)	24 (20)
Time willing to devote to HCV training†			
Number of respondents	146 (100)	33 (100)	113 (100)
30 min trainings spread over 3 months	23 (16)	6 (18)	17 (15)
Full day (8 h)	18 (12)	11 (33)	7 (6)
Half day (4 h)	45 (31)	8 (24)	37 (33)
One (1) h	51 (6)	6 (18)	45 (40)

*Chi-square p-value < 0.05

†Chi-square p-value < 0.001

an interest in learning more about HCV screening and treatment; however, there were diverse preferences for training modalities, with physicians preferring less time for training. These findings indicate that the primary care respondents had moderate knowledge of HCV screening, limited knowledge of HCV treatment, and were open to expanding their knowledge.

Based on this analysis, a combination of interventions that may support providers includes decision-support tools in the electronic medical record, patient education, and capacity building support to promote HCV screening in the primary care setting. Most respondents had a professional interest in expanding their capacity to treat HCV and reported interest in additional training opportunities. DC Department of Health and Department of Health Care Finance should consider various ways in which they can support local providers to expand screening and treatment of HCV based on the results of this survey. Learning preferences differed somewhat between provider types; these preferences should be taken into account when planning for training opportunities.

Potential interventions for increasing HCV treatment capacity include increasing provider knowledge and implementing system changes. Creating a collaborative community of HCV champions in DC that can learn from experts and share experiences may be an opportunity in which HCV screening and treatment knowledge can be quickly disseminated to the primary care provider community [7, 25]. The Project ECHO model provides a structured framework in which primary care providers can learn from experts, during the process of reviewing cases together, in order to eventually expand their own treatment capacity. Structural changes, such as decision-support tools based in electronic medical records, could make HCV screening more routine for affected populations.

The limitations to this study are described below. The survey was a convenience sample conducted via online outreach to licensed health care providers in DC during March 2018 and represents only a small percentage of all licensed medical providers in the jurisdiction. The survey response rate was low; therefore, it likely does not fully represent existing knowledge, attitudes, and practices of the entire health care community in Washington, DC. Respondents may be more interested in HCV than non-respondents, which may have led to bias in the responses received towards favorable attitudes towards HCV screening and treatment. In addition, while the online survey portal was available to participants, we observed that respondents could complete it without providing their medical specialty. This technical issue was corrected while the survey was active but resulted in 21 physicians who had to be categorized as "unknown specialty."

The landscape of health care coverage policies for HCV screening and treatment and the availability of newer DAA regimens is a quickly evolving field. This study identified clear gaps in HCV screening and treatment knowledge among primary care providers in DC. Improving HCV screening knowledge among these providers will help DC identify more people with HCV, and improving treatment knowledge and capacity, is expected to reduce the burden of HCV among the population. A multifaceted intervention approach that addresses the knowledge gaps, willingness, and capacity of primary care providers to screen for and treat HCV is likely to be successful.

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Compliance with Ethical Standards

Conflict of interest There were no real or potential conflict of interest.

Ethical Approval Please see the Human Subjects Protections described in the Methods section for details. All procedures performed in this study were in accordance with the ethical standards of the institutional research committees of the DC Department of Health and George Washington University and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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