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Predictors of hepatitis C testing intention among African American Baby Boomers

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ABSTRACT

Baby Boomers (BBs) are responsible for three-quarters of hepatitis C virus (HCV) infections in the United States; however, HCV testing is distinctly underused by them. A cross-sectional study was conducted to assess the prevalence of HCV testing and to evaluate predictors of HCV testing intention among African–American BBs. The study was guided by the Health Belief Model and theory of reasoned action frameworks. Of the 137 participants included in the study, 44.8% had at least a college education; 13.9% received prior to 1992 blood transfusion. Findings related to HCV testing showed that 32.1% of the participants intended to test for HCV within 6 months and 43.8% had received a previous HCV test. Significant predictors of HCV testing intention within 6 months included having a blood transfusion prior to 1992 [odds ratio (OR) = 8.25, 95% confidence interval (CI): 2.02–33.61], perceptions of benefits (OR = 1.57, 95% CI: 1.13–2.18), severity (OR = 1.39, 95% CI: 1.17–1.65), and subjective norms (OR = 1.42, 95% CI: 1.12–1.79). These predictors of HCV testing intention can be used to develop future HCV testing initiatives for African–American BBs.

1. Introduction

Hepatitis C virus (HCV) infection started as an epidemic between the 1960s and 1980s [1]. The World Health Organization estimates that >170 million people are living with HCV worldwide [2]. This infection is a primary public health concern among ~4 million people infected with HCV in the United States; particularly among people born between 1945 and 1965, for whom this is the main blood borne infection [1,3,4]. This population subgroup, commonly known as Baby Boomers (BBs), has five times the risk of HCV than other groups [5].

Encouraging testing and treatment for BBs is critical. However, these efforts have been challenging because BBs are mostly unaware of their HCV vulnerability and status [6]. Evidence suggests underuse of HCV testing services, despite the earlier promotion of testing by the United States Centers for Disease Control and Prevention (CDC) in 1998 [7]. Recently updated recommendations from the CDC published in August 2012 emphasize that all BBs should have a one-time HCV test to prevent adverse health consequences [5]. Given the evidence of a low perception of susceptibility to HCV [6], it is important to examine whether this is a predictor of intention to test for it in this population.

A review of the literature review has shown a scarcity of theory-based research examining factors that predict or explain the willingness of BBs to have an HCV test. Specifically, the effects of variables related to the behavioral theories, such as knowledge perceptions, cues to action, and subjective norms [8,9], on intention to test for HCV have not been well investigated. Lack of such theory-driven HCV testing studies among African–American (AA) BBs is also evident in the literature. Given that sociodemographic and psychosocial factors determine health-seeking behaviors, it would be significant to understand which of these factors affect intention to test for HCV among AABBs.

The Health Belief Model (HBM) and the theory of reasoned action (TRA) include several psychosocial constructs that can be used to model preventive seeking behavior [10,11]; however, few studies have used them to evaluate HCV testing behavior. The purpose of this study was to assess the prevalence of HCV testing and to determine whether HBM/TRA constructs, prior HCV testing and other sociodemographic characteristics predict intention to testing for HCV among AABBs. We were particularly interested in testing whether the perception of susceptibility would affect intention to test for HCV.

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2. Participants and methods

2.1. Study design and population

The study had a cross-sectional design and included a convenience sample of 137 persons. The study started on February 1, 2014 and continued to March 30, 2014. Respondents recruited were AAs residing in Washington DC area, aged 44–69 years, and who were visiting or receiving service at Howard University Hospital and Ms. Bernice Elizabeth Fonteneau Senior Wellness Center in Washington DC. Respondents who were incapable of using the audio computer-assisted self-interview (ACASI) system were excluded from the study. A gift card for 10 US dollars was provided as an incentive. This study was approved by the Howard University Institutional Review Board.

2.2. Sample size calculation

A total of 137 participants were included in the study; 80 of them were recruited from Howard University Hospital and the remaining 57 were from Ms. Bernice Elizabeth Fonteneau Senior Wellness Center. This sample size was sufficient and had 80% power to test the primary hypothesis based on a multiple logistic regression analysis assuming $\alpha = 0.05$; an assumed odds ratio and R^2 of 2.96 and 0.20, respectively. These assumptions were based on previous studies that have utilized the HBM model.

2.3. Data collection

The interviews were conducted using ACASI with an instrument developed specifically for this study. The instrument used in this study was created from previously used questionnaires by Poss et al. [12], which provided items for assessment of HBM/TRA constructs and from Lindsay et al. [13] and Proeschold et al. [14], who offered items relevant for the evaluation of HCV knowledge. Items to collect sociodemographic and prior HCV testing history were also added. The survey items were modified to suit our study population and subject matter and retested for reliability in a separate pilot study before the start of this study. After informed consent had been provided, data collection was done in a designated area at the recruitment sites under the oversight of study personnel.

2.4. Statistical analysis

Descriptive statistics were estimated for the primary outcome HCV testing intention within 6 months, along with other study variables (i.e., demographics, prior testing history, HBM and TRA constructs, and HCV knowledge). Means and standard deviations were used for continuous variables while frequencies and proportions were used for categorical variables. A logistic regression analysis was conducted to examine factors that predict willingness to test for HCV within 6 months. Both simple and multiple logistic regressions were performed. Covariate selection into the final multivariable model was based on whether the variable met the criteria of $p < 0.2$ in the simple logistic regression or whether it was of theoretical/clinical importance in the study. The variables assessed included HBM constructs, TRA construct of subjective norms, age, marital status, income, gender, education, previous HCV testing, health insurance, having a blood transfusion prior to 1992 and HCV knowledge. Adjusted and unadjusted odds ratios (ORs) with their 95% confidence intervals (CIs) were estimated and reported. Based on literature findings, interaction testing was also conducted to evaluate possible effect modification of the effect of perceived susceptibility (an HBM construct) and subjective norms (TRA construct). All analyses were performed using SPSS version 22 at an α value of 0.05.

3. Results

3.1. Patient characteristics

Of the 137 participants, 60.6% were female, and 44.8% had at least a college education. The mean age of respondents was 58.85 years. An estimated 43.8% of AABBs had a previous HCV test; 11 of whom were HCV positive while 32.1% of respondents had the intention to test for HCV within 6 months. About 68% did not consider themselves susceptible to HCV as AABBs and 72.3% as BBs. Other characteristics are summarized in Table 1.

3.2. Predictors of intention to test for HCV within 6 months

Table 2 shows results of the logistic regression analysis modeling intention to test for HCV within 6 months. Findings from the adjusted analysis showed that age, prior blood transfusion, subjective norms, perceived severity, and perceived benefits were statistically significant adjusted predictors of intention to test for HCV within 6 months. The model χ^2 was 54.24 (degrees of freedom = 10, $p \leq 0.0001$), and the Hosmer–Lemeshow test was not significant ($p = 0.347$) indicating good model fit. Nagelkerke R^2 was 0.329, which means that 32.9% variability in intention to test for HCV within 6 months is explained by the variables included in the model.

Table 2 shows that age had an inverse relationship with intention to test for HCV within 6 months. A 1-year increase in age was associated with a decrease in the odds of having an HCV test

Table 1
Sociodemographic and health-related characteristics of respondents.

Sociodemographic characteristics	Findings
Age	58.85 ± 6.38
HCV knowledge score	48.74 ± 26.24%
Gender	
Male	54 (39.40)
Female	83 (60.60)
Education	
No school/grades 1–11	16 (11.80)
High school	59 (43.40)
College degree	35 (25.70)
Graduate degree	26 (19.10)
Prior to 1992 received a blood transfusion or blood products	
Yes	19 (13.90)
No/unsure	118 (86.20)
Susceptible to HCV as African American	
Yes	44 (32.10)
No	93 (67.90)
Susceptible to HCV as Baby Boomer	
Yes	38 (27.70)
No	99 (72.30)
Prior test for hepatitis C	
Yes	60 (43.80)
No	77 (56.20)
Test result (n = 60)	
Negative	49 (81.70)
Male	20 (40.80)
Female	29 (59.20)
Positive	11 (18.30)
Male	5 (45.50)
Female	6 (54.50)
Intention to test for HCV within next 6 months	
Yes	44 (32.10)
No	93 (67.90)

Data are presented as mean ± standard deviation or *n* (%).
HCV = hepatitis C virus.

Table 2
Predictors of HCV testing intention within 6 months.

Characteristic	$OR_{unadjusted}$ (95%CI)	$p_{unadjusted}$	$OR_{adjusted}$ (95%CI)	$p_{adjusted}$
Age	0.91 (0.86, 0.97)	0.004	0.90 (0.82, 0.98)	0.011*
Male	REF	REF	REF	REF
Female	0.46 (0.22, 0.95)	0.036	0.47 (0.18, 1.22)	0.119
No prior transfusion	REF	REF	REF	REF
Prior transfusion	1.58 (0.77, 3.26)	0.013	8.25 (2.02, 33.61)	0.003*
No prior HCV test	REF	REF	REF	REF
Prior HCV test	1.11 (0.79, 1.56)	0.083	1.34 (0.49, 3.70)	0.575
Cues to action[a]	1.04 (0.38, 2.85)	0.372	0.28 (0.08, 1.07)	0.063
Perceived barriers[b]	0.98 (0.84, 1.14)	0.328	0.93 (0.83, 1.05)	0.268
Subjective norms[c]	3.54 (1.31, 9.58)	0.001	1.42 (1.12, 1.79)	0.003*
Perceived susceptibility[d]	1.90 (0.92, 3.93)	0.042	0.94 (0.81, 1.09)	0.381
Perceived severity[e]	1.47 (0.63, 3.43)	0.003	1.39 (1.17, 1.65)	0.008*
Perceived benefits[f]	1.04 (0.96, 1.12)	0.082	1.57 (1.13, 2.18)	0.015*
Knowledge[g]	1.32 (1.12, 1.56)	0.046	1.10 (0.87, 1.40)	0.409
Wellness center	REF	REF	REF	REF
Howard hospital	0.725 (0.346, 1.52)	0.392	0.603 (0.227, 1.60)	0.143
Perceived barriers	0.98 (0.84, 1.14)	0.328	0.93 (0.83, 1.05)	0.268

$R^2 = 0.32$; *$p < 0.05$.
CI = confidence interval; HCV = hepatitis C virus; OR = odds ratio.
[a] Any strategies motivating willingness to test.
[b] Barriers that prevent patient from having a test.
[c] Perceived social impact on readiness to have a test.
[d] Perception of acquiring the disease.
[e] Patient perception of disease severity.
[f] Belief in the effectiveness of the test in risk reduction.
[g] Knowledge of respondents regarding HCV.

(OR = 0.90, 95% CI: 0.82–0.98). Participants who had blood transfusion prior to 1992 had eight times the odds of intending to test for HCV within 6 months compared to those who did not have a prior blood transfusion (OR = 8.25, 95% CI: 2.02–33.61). Increased odds of intention to test for HCV within 6 months was also observed for those with higher subjective norms scores (OR = 1.42, 95% CI: 1.12–1.79), perceived severity scores (OR = 1.39, 95% CI: 1.17–1.65), and perceived benefit scores (OR = 1.57, 95% CI: 1.13–2.18). There was no effect of perceived susceptibility on intention to test for HCV within 6 months. Possible interaction between susceptibility and subjective norms was evaluated, and no interaction effect was found.

4. Discussion

This study sought to assess the prevalence of HCV testing and to determine factors associated with HCV testing among AABBs. To the best of our knowledge, this is one of the first studies to assess HCV testing intentions in this population. Our findings show evidence of low HCV testing intention among AABBs, with only 32.1% of the participants reporting intention to have an HCV test within 6 months. Based on BBs being a high-risk group, these findings of HCV testing intention are suggestive but not confirmatory for low future testing rates among AABBs, as intentions are not representative of actual testing behavior. However, the 43.8% prior HCV testing rate observed shows evidence of low HCV testing rates and substantiates earlier data showing that nearly 83% of BBs do not perceive themselves to be at risk [6]. As most of the studies on intention to test for HCV have been among populations of drug users [15–18], comparison with our estimates are challenging and further studies to confirm our findings are needed. In the meantime, HCV testing educational programs among AABBs would improve their awareness and HCV testing.

As expected participants who reported having a blood transfusion prior to 1992 were more likely to intend to test for HCV within 6 months than those who did not (OR = 8.25, 95% CI: 2.02–33.61). No comparative studies were available to confirm our findings; however, a possible explanation for these results is that people who had transfusions prior to 1992 would have higher perceptions of risk perhaps from information gathered from public health messages on the potential for contaminated blood during that period, leading them to have a greater intention to test. More studies can be done to see if these findings can be replicated in other studies.

Subjective norms score was found to be a significant predictor of intention to test for HCV among AABBs. Specifically, those with higher scores on subjective norms were more likely to have the intention to test for HCV within 6 months (OR = 1.42, 95% CI: 1.12–1.79). A possible explanation for these findings could be the culture of collectivism within the AA community. Existing literature supports that one of the main cultural values accredited to AAs is collectivism [19–23]. In collective cultures, interdependence levels between individuals and willingness to be affected by others are both high. Since subjective norms were a significant predictor of intention to test for HCV, using community-based approaches that use respected family or valued peers may work best to increase awareness of HCV and subsequent testing.

Respondents with more perceived severity of HCV infection (OR = 1.39, 95% CI: 1.17–1.65) were more likely to have intention to test for HCV, while the perceived impact of susceptibility on intention to test, our primary hypothesis, was not a significant predictor in the adjusted model. Null findings from our primary hypothesis were contrary to studies that have looked at how perceived susceptibility affects other screening behavior, such as colorectal cancer screening within this population [24]. Findings related to severity also were unexpected since this construct has been identified to have weak relationships with preventive behavior in general [25]. Collectively, it is plausible that perception of severity, rather than vulnerability to infection would be a motivator for HCV testing for this population; however, further studies are needed to confirm this effect.

Our study was not without limitations. First, the study design was cross-sectional in nature, thus no causal inferences can be made. A convenient sampling was used in this study; thus, the recruited sample may not be generalized to AABBs in Washington

DC. Second, this study did not follow up to identify testing behavior; instead, we relied on intention to test for HCV within 6 months as a proxy for actual behavior. Third, all items in the study were based on self-report. As such, this study may have been prone to some social desirability bias. Particular items with potential for reporting bias could have been those related to prior HCV testing and results; however, this effect may have been minimized by our use of the ACASI method during data collection. Lastly, our study was conducted in the Washington DC region. Further evaluation must be carried out in different geographical areas to confirm these findings for other AABBs. Despite these limitations, our study adds new knowledge on the prevalence and predictors of HCV testing intention in this high-risk group.

5. Conclusion

Low rates of intention to test for HCV as well as prior HCV testing history observed in this study point to the need to develop screening and education programs for AABBs. Such screening programs can focus on alerting AABBs on the severity as well as the potential benefits of testing. Findings on subjective norms indicate that community approaches involving family, or valued peers may assist in the acceptance of such programs. Further studies to confirm our findings in other similar populations are recommended.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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