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## Knowledge, Attitudes, and Behaviors of Hepatitis B Screening and Vaccination and Liver Cancer Risks Among Vietnamese Americans

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### Abstract

Hepatitis B Virus (HBV) infection is a serious health problem among Asian Americans. Vietnamese Americans are disproportionately affected by liver cancer compared with other racial and ethnic groups. Vietnamese males have the highest incidence of liver cancer of any racial group; incidence of liver cancer among Vietnamese males is 11 times higher than among White males. Nearly 80% of liver cancer is attributed to HBV. This study measured knowledge, attitudes, and behaviors related to HBV screening and vaccination. The study was conducted among 256 Vietnamese Americans in the greater Philadelphia and New Jersey area, with a large number of underserved, recent immigrants with low socioeconomic status and limited English proficiency. Participants were recruited from Vietnamese community-based organizations. Overall, 46.3% of the sample had heard of HBV or knew about the availability of screening (32.6%) or vaccination (35.5%) while 7.5% were ever screened and 6.3% had been vaccinated. Community-based, culturally appropriate interventions for Vietnamese Americans and health care providers should increase screening and vaccination rates.

### Keywords

Hepatitis B; liver cancer; Asian Americans; Vietnamese Americans

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Vietnamese Americans are one of the fastest growing ethnic groups in the United States. There are over 1.2 million Vietnamese Americans in the U.S. and the number will reach

nearly 4 million by the year 2030, making it the second largest Asian and Pacific Islander ethnic group in the United States.<sup>1</sup> Despite the community's rapid growth in recent years, little is known about its cancer incidence patterns.

Vietnamese differ from other Asian immigrant groups in their more recent immigration and in their cultural patterns and dietary practices, which can lead to heightened cancer risks.<sup>2</sup> Vietnamese are disproportionately more affected by liver cancer than other racial and ethnic groups, with males having the highest incidence of liver cancer of any ethnic group; their incidence rate is 11 times higher than that of White males.<sup>3</sup> Hepatitis B virus (HBV) is a significant agent, contributing to 80% of liver cancers.<sup>4</sup> Chronic infection with HBV is a significant risk factor for cirrhosis and liver cancer,<sup>5</sup> leading to risk over 200 times greater than for those not infected;<sup>6</sup> 1 in 4 people with chronic HBV infection eventually die of cirrhosis or liver cancer.<sup>7</sup> The elevated liver cancer incidence rate among Vietnamese is attributed to the high seroprevalence of HBV infection. The rates of HBV surface antigen positivity among Vietnamese Americans range between 7% and 14%.<sup>8,9,10,11,12,13</sup>

In spite of the disproportionately high incidence of liver cancer and widespread HBV infection in this population, very little research exists that sheds light on knowledge and beliefs about this disease among Vietnamese Americans. Extant research reveals low levels of knowledge regarding HBV infection, transmission, and prevention. A study examining HBV knowledge in Seattle's Vietnamese community revealed that, while two-thirds of study respondents had heard of HBV infection, less than 60% knew that asymptomatic individuals can transmit the disease to others, and only a minority knew that HBV infection can be lifelong and incurable. A significant number of respondents had never heard of the HBV vaccine.<sup>4</sup> Another study found that Vietnamese youth, who have the highest seroprevalence of HBV, were much less likely than those in other racial groups to identify sexual contact with an infected person as a critical risk factor for transmission.<sup>14</sup> This lack of knowledge may be related to the under-utilization of preventive measures and the low rates of immunization among Vietnamese, especially in the age group 3 to 18 years.<sup>15</sup>

In addition to lack of knowledge about HBV, Vietnamese Americans face multiple health delivery system barriers that limit their abilities to use the system's preventive, screening, and immunization services effectively. A number of studies have shown that Vietnamese are less likely to receive cancer screening tests than the general population.<sup>16,17,18</sup> Pham and colleagues<sup>19</sup> found that communication represents a major barrier to receiving health care services. The 2000 Census data show that 62.4% of Vietnamese Americans either do not speak English at home or speak the language "less than very well."<sup>20</sup> Pham and colleagues<sup>19</sup> noted that interpreter services, translated educational materials, health education classes, and community health fairs are high on the priority list of Vietnamese communities. While cultural practices have often been identified as contributors to lack of utilization of health services, research conducted by Jenkins and colleagues revealed that accessibility to the health care system itself was the most important determinant of preventive health care utilization among Vietnamese.<sup>21</sup> Prevention messages should be communicated in a language that is understood by the population.<sup>22</sup>

The purpose of this study was to identify prevailing beliefs, attitudes, and practices about HBV infection, its transmission, and liver cancer risks among Vietnamese Americans. Additionally, respondent serological testing and vaccination history were examined. This information will serve as a basis for designing HBV-related intervention programs needed in the Vietnamese community.

## Methods

### Sample.

Vietnamese American participants (N=256) in greater Philadelphia and New Jersey were recruited from eleven community-based organizations that serve low-income, low educational level Vietnamese Americans whose native language is not English. Vietnamese adults administered the cross-sectional study in Vietnamese at sampled community sites. Participants were given the choice of English or Vietnamese for the survey. A sample of 282 people were administered the survey; 256 completed it, for a response rate of 90.7%.

### Instrument.

A pilot test was conducted among 27 Vietnamese adults. The survey was modified for language readability. Face validity was achieved based on comments from pilot participants. The internal reliability was measured by kappa statistics and Cronbach's alpha for dichotomous and polychotomous variables and by the Spearman rho for ordinal variables. A Spearman rho was performed on the demographic variables *educational level* and *household income* and a significant ( $p < .01$ ) positive correlation of .65 was obtained. There was excellent agreement between *ever getting screened* and *when did you get screened* (.87,  $p < .001$ ) and good agreement between *ever getting screened* and *screening result* (.64,  $p < .01$ ). Cronbach's alpha was .94 overall for these three items, indicating high reliability for measurement of screening behavior.

The instrument consisted of 47 close-ended questions (see tables). The questionnaire was divided into four sections: the first section consisted of sample demographics (i.e., age, sex, ethnic background, marital status, education level, and income) and acculturation (i.e., English language ability and use); the second included items that related to participants' knowledge and beliefs about HBV, its modes of transmission, and its prevention, and participant's perceived ability to control the adverse sequelae of HBV through screening and immunization; the third consisted of questions related to screening behavior; and the fourth was made up of items measuring health perceptions.

### Procedures.

The institutional review board of Temple University approved the study protocol. Written informed consent was obtained from all study participants, and all data were collated and analyzed without personal information identification.

### Data analysis.

Descriptive statistics were reported for demographic variables (age, ethnicity, sex, birthplace, years lived in U.S., marital status, education level, employment, household

income, type and status of insurance coverage, and English language fluency), knowledge (association of HBV and liver cancer, knowledge of screening test and vaccination, mode of transmission, activities that prevent HBV), attitudes concerning HBV (cancer being curable, preventable, and within lifestyle control), and screening and vaccination behavior (health check-ups, frequency). Chi-square analyses were conducted for the bivariate relationship between the dependent variables of *being screened* and *vaccinated* and the independent variables of demographics, knowledge, and attitudes about HBV.

## Results

### Demographic characteristics of respondents.

The mean age of participants was 41.8 years (Table 1). The majority (95.7%) was born outside the U.S. and had lived in the U.S. an average of 11 years. Most respondents were married (64.1%), had a high school or less than high school education (84.4%), earned an annual income of less than \$20,000 (79.3%) and had some type of health insurance coverage (66%). The majority of the respondents (88.2%) could neither speak nor read English. Less than half of the respondents (42.2%) were employed.

There were significant differences in screening by sex ( $\chi^2$  (3, N=256)=10.3,  $p<.01$ ); education level ( $\chi^2$  (3, N=256)=13.2,  $p<.05$ ); employment ( $\chi^2$  (3, N=256)=10.7,  $p<.05$ ); income ( $\chi^2$  (3, N=256)=11.1,  $p<.05$ ) and reading English fairly/poorly or not at all ( $\chi^2$  (3, N=256)=7.0,  $p<.05$ ). Participants were more likely to have been screened if they were male, had higher education, and spoke or read English fluently. There were significant differences in vaccination by education level ( $\chi^2$  (3, N=256)=24.1,  $p<.01$ ); and income ( $\chi^2$  (3, N=256)=18.6,  $p<.001$ ).

### Knowledge and attitudes towards hepatitis b and cancer.

One-third of participants thought that cancer was beyond their control (60.6%); over half did not know that cancer was curable (59.2%) or that it could be prevented (58.8%) (Table 2). Close to half of the participants (46.3%) had no knowledge about HBV; and about a third were aware of the existence of a screening test for HBV (32.6%) and vaccination (35.5%). The majority thought that HBV could be transmitted through sharing food plates with a carrier (59.9%), sharing or using needles (49.6%), from mother to child during birth (62%), or sharing toothbrushes (41.6%). Only 22.6% were aware that HBV was transmitted through sexual intercourse; however, 70.5% felt that getting vaccinated would prevent HBV.

A chi square test (Table 2) indicated that those who believed cancer was curable were significantly more likely to get screened (72.2%) than those who did not get screened (30.6%) ( $\chi^2$  (2, N=256)=13.2,  $p<.001$ ). Participants were also more likely to get screened if they knew that cancer was preventable (88.9%) and had knowledge of HBV (50%), a screening test for HBV (89.5%), a vaccine against HBV (94.7%) and that the vaccine would be protective (94.4%) than those who did not know.

Participants were also significantly more likely to have been vaccinated (Table 3) if they believed cancer was curable (60%) or preventable (73.3%), if they knew of screening tests for HBV (43.8%) or a vaccine against HBV (100%), if they thought HBV spread through

sharing needles (75%) or toothbrushes (75%) and if they thought that the vaccine would be protective (93.8%), than if they did not believe these things.

### Health behavior of Vietnamese.

Three-quarters of participants (74.6%) (Table 4) indicated that they had received at least one general health check-up in the U.S. and 86.5% reported that they received at least one general health check-up in their lifetime, although a substantial proportion (44.1%) had not received a check-up in the past year. Only 7.5% of participants reported being screened for HBV and, of those screened, 20% reported being HBV positive. A very small number (6.3%) reported getting vaccinated against HBV.

## Discussion

This study examined knowledge, attitudes, and behaviors toward HBV screening and vaccination, and barriers that affect screening and vaccination among Vietnamese Americans of low socioeconomic status, low educational level, and limited English language proficiency.

Consistent with previous studies among children,<sup>14</sup> the findings showed that the majority of study participants did not understand the relationship between lifestyle and cancer. Less than half of the participants reported that they had heard of HBV, and only a third knew that there was screening and vaccination for it. The findings corroborated previous studies among other populations<sup>23</sup> showing that, while more than half of the participants recognized certain modes of viral transmission (sharing food or needles with carriers), more than three-quarters (77%) did not identify sexual intercourse as a transmission mode. While our study data indicated a general awareness of HBV and transmission among Vietnamese participants, serious gaps in knowledge were revealed by the data. These may be attributed to poor English language proficiency, ineffective health communication in Vietnamese American communities, physical and psychological barriers, and cultural mores that prevent exchange of information on intimate subjects such as sex. (Tang and associates,<sup>24</sup> for example, noted that Asians are generally uncomfortable discussing sexuality with health care providers).

The U.S. health delivery environment may contribute to lack of knowledge about hepatitis B and related topics among Vietnamese Americans because the infection is no longer considered a serious health issue in the population at large. The fact that 66% of the study participants had some type of health insurance coverage, and yet that most report that they had no screening or vaccination for HBV may be largely attributed to lack of sensitivity in the U.S. health delivery systems to the health factors faced by minority populations generally and recent Asian immigrants, in particular. Low socioeconomic and educational levels as well as low levels of acculturation may amplify the potential lack of sensitivity. Whatever the causes, the data underscore the importance of implementing educational campaigns focused on increasing screening and vaccination behavior in the target population of this study. The importance of education is reflected in the fact that study participants were significantly more likely to get screened and vaccinated if they knew cancer was preventable and they knew there were a test and a vaccine for HBV.

### Screening and vaccination behavior.

The data on screening and vaccination suggest that a large proportion of asymptomatic HBV carriers go undetected when they could be screened and vaccinated to reduce the risk of future liver disease. Most participants were never screened (92%) or vaccinated (93%).

Because the sample of participants was predominantly Vietnamese people of low socioeconomic status, of low education levels, and with little or no English proficiency, the authors caution that any generalizations beyond this sample may be inappropriate or limited. In addition, the authors caution that because of the study's cross-sectional research design, causality cannot be assumed or inferred from the findings. For example, while the data show that some participants were aware that cancer may be curable or preventable, and knew that there were screening tests and vaccinations for HBV, it would be inappropriate to assume that this awareness or knowledge is a causative factor for the observed significant difference between those who were screened and vaccinated and those who were not. Further, since the assessment of screening and vaccination was based on self-report and was not verified with serological confirmation, rates reported may not accurately represent rates of services received.

Generally, the study underscores the importance of designing culturally appropriate health interventions to improve screening and vaccination for hepatitis B among Vietnamese Americans as well as a more focused public health effort directed at educating the Vietnamese community at large and sensitizing health providers about the special needs of these communities and the obstacles they face when navigating through the U.S. health delivery system. A community education effort should emphasize the lifelong impact of the HBV virus, its mode of transmission, and the positive outcomes that accrue from early screening and vaccination. Health providers should be made aware of the fact that, although hepatitis B is no longer a significant public health issue in the U.S. population, it is significant among the rapidly increasing Asian population in the U.S.

The findings of this study confirm the observations of other researchers with regard to the importance of education level and English fluency in predicting screening behavior<sup>25</sup> and also agree on the need to direct education to individuals of low socioeconomic status.<sup>26</sup> Our findings also demonstrate that a successful screening and vaccination program must be contextually, culturally, and linguistically appropriate. Vietnamese Americans face both a high prevalence of HBV infection and multiple barriers that prevent them from seeking preventive care that would ameliorate the life-threatening sequelae of the infection. Health programs designed for immigrant populations should be based on a thorough understanding of the target population's knowledge, beliefs, and practices regarding HBV and liver cancer, and any prevention message should be communicated in a language that is understood by the population.<sup>22</sup>

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**Table 1.**  
**SAMPLE CHARACTERISTICS BY SCREENING AND VACCINATION BEHAVIOR**

	Total N=256 (%)	Screened n=19 (%)	Not screened n=237 (%)	Vaccinated n=16 (%)	Not vaccinated n=240 (%)	$\chi^2$
Age, in years (Mean, SD)	41.8 (16.4)	49.1 (13.9)	41.2 (16.6)	44.1(14.2)	41.7 (16.7)	
25	19.4	0	20.0	0	20.0	
26-35	18.4	21.1	17.9	37.5	17.0	
36-50	28.2	21.1	28.6	25.0	27.7	
51-65	25.9	42.1	24.8	25.0	26.4	
66+	9.1	15.8	8.6	12.5	9.0	6.9
Sex						
Male	34.4	68.4	31.9	43.8	33.9	
Female	65.6	31.6	68.1	56.3	66.1	0.6
Born outside U.S.	95.7	100	98.2	100	98.3	
Years in U.S. (M, SD)	11.0 (6.8)	13.5 (7.3)	10.8 (6.7)	12.4 (7.7)	10.9 (6.7)	
Marital status						
Married	64.1	73.7	63.2	56.3	64.7	
Single	28.1	21.1	29.1	37.5	28.1	
Divorced/Separated	3.1	0	3.4	6.3	2.6	
Widower	3.5	5.3	.3	0	3.8	2.1
Education level						
< High school	29.3	15.8	30.4	18.8	30.3	
High school	55.1	42.1	56.7	37.5	56.4	
University	13.7	36.8	12.0	31.3	12.8	
Graduate and above	1.2	5.3	.9	12.5	.4	24.1 **
Employment						
Employed	42.2	36.8	43.1	46.7	42.3	
Unemployed	15.6	36.8	14.2	20.0	15.4	
Retired	8.2	15.8	7.8	20.0	7.7	
Homemaker	20.3	10.5	21.1	6.7	21.4	
Student	12.5	0	13.8	6.7	13.2	4.7

	Total N=256 (%)	Screened n=19 (%)	Not screened n=237 (%)	$\chi^2$	Vaccinated n=16 (%)	Not vaccinated n=240 (%)	$\chi^2$
Household income							
<\$20,000	79.3	50.0	82.4		66.7	79.2	
20,000–30,000	15.7	33.3	13.9		8.3	17.9	
30,000–40,000	2.5	8.3	1.9		16.7	.9	
40,000+	2.5	8.3	1.9	11.1*	8.3	1.9	18.6***
Have health insurance	66.0	63.2	66.4	.1	56.3	66.9	0.8
Type of health insurance							
Medicare	18.7	33.3	17.7		44.4	17.5	
Medicaid	34.5	25.0	34.8		22.2	34.4	
Other	46.8	41.7	47.5	1.8	33.3	48.1	4.0
Speak English							
Very fluently	11.8	22.2	11.1		26.7	11.0	
Fairly/Poorly/None	88.2	77.8	88.9	4.3	73.3	89.0	3.7
Read English							
Very fluently	11.8	27.8	10.7		25.0	11.1	
Fairly/Poorly/None	88.2	72.2	89.3	7.0*	75.0	88.9	3.2

M = Mean.

SD = Standard deviation.

\* p<.05,

\*\* p<.01,

\*\*\* p<.001

Table 2.

## KNOWLEDGE AND ATTITUDES OF HBV AND CANCER BY SCREENING BEHAVIOR

	Total N=256 %	Screened n=19 %	Not screened n=237 %	$\chi^2$
Cancer occurs beyond control				
Yes	37.4	44.4	37.2	
I don't know	60.6	55.6	60.7	
No	2.0	0	2.1	0.7
Cancer is curable				
Yes	33.7	72.2	30.6	
I don't know	59.2	22.2	62.1	
No	7.1	5.6	7.2	13.2***
Cancer can be prevented				
Yes	31.8	88.9	27.7	
I don't know	58.8	5.6	62.6	
No	9.4	5.6	9.8	29.2***
Know of HBV				
Yes	46.3	41.9	50.0	
I don't know	7.5	8.1	0	
No	46.3	50.0	50.0	23.9***
Think HBV causes liver cancer	64.7	66.7	64.9	0.02
Know of screening test for HBV	32.6	89.5	27.5	30.4***
Know of vaccine for HBV	35.5	94.7	31.2	30.8***
Know mode of transmission				
Share food plates with carrier	59.9	73.7	58.1	1.7
Eating food carrier prepared	28.5	31.6	28.2	0.09
Share or use of needles	49.6	68.4	47.0	3.0
Mother to child during birth	62.0	52.6	63.2	0.8
Share toothbrushes	41.6	57.9	39.3	2.3
Shake hands with carrier	8.8	0	10.3	2.1
Sexual intercourse	22.6	15.8	23.9	0.6
Activities that prevent HBV				
Exercise	28.1	33.3	27.5	0.3
Eating more oranges	20.1	11.1	21.7	1.1
Washing hands before eating	48.2	38.9	50.0	0.8
Get vaccinated	70.5	94.4	66.7	5.8*
Get enough sleep	18.0	22.2	17.5	0.2

\*  
p<.05,\*\*  
p<.01,\*\*\*  
p<.001

**Table 3.****KNOWLEDGE AND ATTITUDES OF HBV AND CANCER BY VACCINATION BEHAVIOR**

	Total N=256 %	Vaccinated n=16 %	Not vaccinated n=240 %	$\chi^2$
Cancer occurs beyond control				
Yes	37.4	57.1	35.6	
I don't know	60.6	42.9	62.3	
No	2.0	0	2.1	2.8
Cancer is curable				
Yes	33.7	60.0	31.4	
I don't know	59.2	20.0	62.3	
No	7.1	20.0	6.4	11.4**
Cancer can be prevented				
Yes	31.8	73.3	28.8	
I don't know	58.8	13.3	62.3	
No	9.4	13.3	8.9	14.9***
Know of HBV				
Yes	46.3	42.1	75.0	
I don't know	7.5	8.1	0	
No	46.3	49.8	25.0	20.2***
Think HBV causes liver cancer	64.7	84.6	63.2	2.4
Know of screening test for HBV	32.6	43.8	5.1	18.6***
Know of vaccine for HBV	35.5	100	0	24.4***
Know mode of transmission				
Share food plates with carrier	59.9	68.8	58.8	0.6
Eating food carrier prepared	28.5	37.5	27.7	0.7
share or use of needles	49.6	75.0	46.2	4.7*
Mother to child during birth	62.0	75.0	60.5	1.3
Share toothbrushes	41.6	75.0	37.0	8.4**
Shake hands with carrier	8.8	6.3	9.2	0.2
Sexual Intercourse	22.6	37.5	20.2	2.5
Activities that prevent HBV				
Exercise	28.1	43.8	25.8	2.3
Eating more oranges	20.1	18.8	19.2	0.002
Washing hands before eating	48.2	37.5	50.0	0.8
Get vaccinated	70.5	93.8	68.3	4.4*
Get enough sleep	18.0	25.0	15.8	0.8

\* p&lt;.05,

\*\* p&lt;.01,

\*\*\* p&lt;.001

**Table 4.**

## SCREENING BEHAVIOR, N=256

	%
Get general health check-up	74.6
Last general health check-up	
Never	13.5
Within last 6 months	10.5
Between 6–12 months ago	31.9
More than 12 months ago	44.1
Ever screened for HBV	7.5
Screening result for HBV (N=19)	
Negative	70.0
Positive (carrier)	20.0
Don't know	10.0
Ever get a vaccine for prevention	6.3

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