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Hepatitis B Knowledge, Testing, and Vaccination Among Chinese and Vietnamese Adults in Australia

Lan H. Vu, BHSc, MPH[1], Zhihong Gu, BSc, MPH[2], Jodie Walton, BA(Hons)[3], Anthony Peet, BNurs, MPH[4], Judith Dean, BNurs, MPHTM[4,5], Michael P Dunne, BA(Hons), PhD[4], and Joseph Debattista, MSc, PhD[1,4]

Abstract

Hepatitis B is a significant public health challenge within some subpopulations in Australia, including Chinese and Vietnamese migrants. There has been limited research on hepatitis B knowledge and actions in these communities. The authors conducted a self-administered survey among 442 Chinese and 433 Vietnamese in Brisbane. Generally, the knowledge is best described as "moderate." One in 2 could not identify the sexual transmission risk and less than one third knew that sharing foods or drinks did not spread the disease. The majority of Vietnamese (80%) and 60% of Chinese respondents indicated prior testing. Vaccination was reported in 60% of the Vietnamese and in 52% of the Chinese. Knowledge was better among Chinese people who had been tested and vaccinated compared with those who were nontested and nonvaccinated. Only 3.5% of the Chinese, but 11.6% of the Vietnamese, indicated having a positive test result hepatitis B virus. This study helps identify strategies for programs targeting both communities and practitioners.

Keywords

Chinese, hepatitis B, knowledge, migrant health, testing, vaccination, Vietnamese

[1]Queensland University of Technology, Brisbane, Queensland, Australia
[2]Ethnic Communities Council of Queensland, Brisbane, Queensland, Australia
[3]Hepatitis Council of Queensland, Brisbane, Queensland, Australia
[4]Queensland Health, Brisbane, Queensland, Australia
[5]Griffith University, Logan, Queensland, Australia

Corresponding Author:
Zhihong Gu, HIV/AIDS, Hepatitis C & Sexual Health Program, Ethnic Communities Council of Queensland, 253 Boundary Street, West End 4101, Queensland, Australia
Email: health@eccq.com.au

Introduction

Despite the widespread availability of vaccination for hepatitis B virus (HBV) in Australia and its overall low prevalence in the general population (<1%),[1] chronic hepatitis B (CHB) remains a serious public health challenge within some subpopulations. Estimates of the number of people living with CHB in the country range from 91 500 to 163 500 persons (0.49% to 0.87%).[1] A large proportion of these infections are known to occur among migrants born in the Asia-Pacific region where HBV infection is highly prevalent.[1,2] While constituting approximately 5% of the Australian population, people born in the Asia-Pacific make up more than 50% of the estimated population living with CHB,[3] the largest proportions of whom are Chinese and Vietnamese migrants.[4] As a consequence, these groups have also been shown to have the highest risks of hepatocellullar carcinoma compared with Australia-born people (relative risk of 10.0 and 11.6, respectively).[5]

Despite the high burden of HBV in these Australian ethnic communities, there has been little research that may inform prevention and care programs. A self-reported HBV infection rate of 7% was found among a sample of 499 Vietnamese Australian men in Sydney.[6] In that study, some sex-related risk practices, including commercial sex, were particularly common,[7] although their knowledge about sexually transmitted infections and blood-borne viruses, including hepatitis B and C, was very low.[6,8] Only 44% of the men knew that hepatitis B infection could be transmitted sexually. This was much lower than the 59% (for men) found in a recent national survey on knowledge of sexually transmissible infections in Australia.[9]

A number of studies have been conducted in the United States and Canada regarding HBV among migrant populations. Suboptimal levels of knowledge about HBV have been found among Chinese[10-14] and Vietnamese migrants.[15-18] Misconceptions about sharing food items with, or eating foods prepared by, HBV carriers were quite common. Only 40% to 65% of Chinese adults were aware of the sexual risk for HBV transmission, whereas half to more than 80% knew about other transmission modes.[10-14] Awareness of sexual transmission risk was found to be as low as 14% to as high as 70% among Vietnamese migrants.[15-18]

Among Chinese people in North America, estimates of HBV testing (ever) ranged between 35% and 60% and vaccination between 30% and 40%.[12-14] Some studies have found very low levels of testing and vaccination among Vietnamese migrants (around 6% to 8%),[16,19] whereas others reported much higher rates (approximately 60% to 70% testing and 30% to 40% vaccination rate).[20,21] This wide variation in estimates highlights the need for further research with migrant populations.

Thus, much uncertainty remains in the estimates of HBV-related knowledge and practices of Asian migrants in North America and Australia. In addition, there is apparently a lack of evidence from community-based research in Australia. The aim of this study was to assess the current state in knowledge and preventive vaccination and testing in Chinese and Vietnamese communities in the city of Brisbane, Australia. This should facilitate the development of responsive interventions to tackle the disproportionate CHB burden among these groups.

Methods

Respondents and Recruitment

A cross-sectional survey was administered through convenience sampling at 6 Chinese and 1 Vietnamese community settings and events identified as key meeting points in the Brisbane metropolitan region. Research assistants employed from each of the target communities approached people of Chinese and Vietnamese background at these locations and invited them to complete an anonymous self-administered survey in their respective language. Persons older than 18 years who could read and speak Chinese or Vietnamese were recruited. Respondents

received a small gift on completion of the questionnaire. The study was coordinated and supervised through the HIV/AIDS, Hepatitis and Sexual Health Program of the Ethnic Communities Council of Queensland with the support of Queensland Health, Hepatitis Council of Queensland, and Queensland University of Technology. Institutional ethics approval was obtained from Queensland Health.

Survey Instrument

The survey instrument was adapted from previous questionnaires used in similar studies internationally.[10-18] It was first prepared in English, then translated and back-translated from English to Chinese or Vietnamese. It was tested in a pilot study among a small sample of Chinese (n = 50) and Vietnamese people (n = 50) in the same areas before it was finalized for the main study.

Knowledge was assessed by asking the respondents whether each of 11 statements concerning hepatitis B was correct. Each question had 3 possible answers as yes, no, and unsure. A testing and vaccination history for each participant was also recorded. Information on place of vaccination and testing, reasons for not being vaccinated, and reasons for testing were explored in open-ended questions. Respondents were also asked to anonymously identify the results of any previous HBV testing, and if positive, whether they were under any current medical management if relevant. Reasons for not receiving medical care were then sought. Demographic information included age, gender, length of time in Australia, and language spoken at home.

Data Analysis

Data were entered into a Microsoft Access database and analyzed in SPSS 16.0. Chi-square tests and *t* tests were used to assess differences between groups, and odds ratios (ORs) adjusted for age and sex were calculated for dependent variables, including testing and vaccination. A total knowledge score was calculated by summing all correct answers.

Results

A total of 931 respondents from the Chinese (n = 487) and Vietnamese (n = 444) communities completed the questionnaire. We excluded those respondents with place of birth from countries other than China or Vietnam, resulting in the final sample for analysis of 875 respondents (442 Chinese and 433 Vietnamese). Sociodemographic characteristics of the respondents are summarized in Table 1. Although average age was similar between the 2 groups, there were more people from Vietnam aged 40 years and older than from China (61% vs 47%, $P < .001$). Vietnam-born respondents had lived in Australia for a significantly longer period compared with China-born respondents (14.5 vs 9.0 years, $P < .001$).

HBV Testing, Vaccination, and Treatment

In all, 60% of Chinese and 80% of Vietnamese respondents reported previous testing for HBV ($P < .001$; Table 1). Just more than half of the Chinese (56%) but the majority of the Vietnamese (86%) who had ever been tested reported testing in Australia. Overall, 52% of Chinese and 60% of Vietnamese respondents reported having been vaccinated against HBV. The majority of Chinese (70%) who had been vaccinated indicated that they received their immunization in their home country whereas 73% of Vietnamese received this in Australia.

Approximately 1 in 4 people reported testing but no vaccination (or they could not recall) in both ethnic groups (24% in each). Having been vaccinated but not tested (or were unsure) was more common among the Chinese (15%) compared with the Vietnamese (5%). The proportions

Table 1. Sociodemographic Characteristics and Hepatitis B Virus (HBV)–Related Practices and Knowledge of Respondents Born in China (n = 442) and Vietnam (n = 433)[a]

	China-Born,[b] n (%)	Vietnam-Born, n (%)	*P* Value[c]
Age in years; mean (SD)	42.7 (19.5)	43.4 (12.0)	
<40	228 (53)	170 (39)	<.001
40-50	68 (16)	153 (36)	
>50	136 (31)	109 (25)	
Gender			
Male	180 (41)	192 (48)	.030
Female	261 (59)	207 (52)	
No. of years in Australia; mean (SD)	9.0 (9.7)	14.5 (9.2)	
≤10	290 (67)	161 (37)	<.001
>10	145 (33)	272 (63)	
Language spoken at home			
Home language only (not including English)	385 (88)	379 (88)	.700
English (±other languages)	55 (12)	50 (12)	
Ever been tested for HBV	264 (60)	343 (80)	<.001
Place of testing	n = 260	n = 337	
Home country (China/Vietnam)	111 (42)	48 (14)	<.001
Australia	145 (56)	289 (86)	
Others	4 (2)	0 (0)	
Cited reasons for testing	n = 240	n = 276	
As part of regular health checks	129 (54)	95 (34)	<.001
Reasons related to HBV[d]	29 (12)	123 (45)	
Others	82 (34)	58 (21)	
HBV test result	n = 260	n = 328	
Positive	9 (3.5)	38 (11.6)	.001
Negative	215 (82.7)	253 (77.1)	
Unsure	36 (13.8)	37 (11.3)	
Ever been vaccinated against HBV	230 (52)	259 (60)	.014
Place of vaccination	n = 194	n = 209	
Home country (China/Vietnam)	136 (70)	37 (18)	<.001
Australia	16 (8)	151 (73)	
Others	42 (22)	19 (9)	
Knowledge about HBV[e]; mean (SD)	6.66 (2.04)	6.56 (2.43)	
Low score	110 (25)	108 (27)	.670
Medium score	239 (55)	212 (52)	
High score	85 (20)	87 (21)	

[a]Data are presented in number and percentage or as otherwise stated; total number varies because of missing values.
[b]Including Hong Kong and Taiwan.
[c]χ^2 test for difference.
[d]For example, afraid of being infected with HBV, to check if having HBV, to prevent HBV, to make sure not having HBV.
[e]Low score = <6; medium score = 6 to 8; high score = ≥9.

who had been neither tested nor vaccinated (or were unsure) were 24% and 15% in the Chinese and Vietnamese groups, respectively.

Among those ever tested, 9 Chinese respondents (3.5%) and 38 Vietnamese respondents (11.6%) indicated that they received a positive HBV test result (Table 1). Five out of 9 HBV-positive Chinese respondents said they were seeing a doctor, and one participant was under treatment for

Table 2. Demographic Factors Associated With HBV Testing Among Chinese and Vietnamese People in Brisbane

	China-Born[a]			Vietnam-Born[a]		
	Ever Tested for HBV			Ever Tested for HBV		
	Yes	No/Unsure	OR[b] (95% CI)	Yes	No/Unsure	OR[b] (95% CI)
Gender						
Male	115 (65)	62 (35)	1 (referent)	159 (84)	31 (16)	1 (referent)
Female	148 (57)	112 (43)	0.7 (0.6-1.0)	157 (77)	47 (23)	0.7 (0.4-1.1)
Age (years)						
<40	128 (56)	100(44)	1 (referent)	134 (79)	35 (21)	1 (referent)
40-50	49 (72)	19 (28)	2.1 (1.1-3.8)	116 (76)	36 (24)	0.8 (0.4-1.3)
>50	79 (60)	53 (40)	1.2 (0.8-1.8)	92 (88)	13 (12)	1.7 (0.8-3.5)
Time living in Australia (years)						
≤10	168 (58)	121 (42)	1 (referent)	122 (77)	37 (23)	1 (referent)
>10	91 (64)	51 (36)	1.2 (0.7-2.1)	221 (82)	47 (18)	1.4 (0.8-2.4)
Language spoken at home						
Home language only	32 (58)	23 (42)	1 (referent)	305 (82)	68 (18)	1 (referent)
English (± other language)	231 (61)	150 (39)	0.9 (0.5-1.7)	35 (70)	15 (30)	0.4 (0.2-0.8)
Having been vaccinated against for HBV						
No/unsure	102 (49)	106 (51)	1 (referent)	102 (61)	65 (39)	1 (referent)
Yes	162 (71)	67 (29)	3.1 (2.0-4.8)	240 (93)	19 (7)	9.8 (5.3-17.9)

Abbreviations: HBV, hepatitis B virus; OR, odds ratio; CI, confidence interval.
[a]Total varies because of missing values
[b]Odds ratio between "yes" versus "no"/"unsure" to ever been tested for HBV, adjusted for age and sex.

HBV (using traditional medicine). A total of 30 HBV-positive Vietnamese reported seeing a doctor (81%), and 18 (56%) were currently on treatment (mostly Western medicine).

Factors Associated With HBV Testing and Vaccination

Age- and sex-adjusted ORs of having been tested for HBV are provided in Table 2. Female Chinese respondents appeared less likely than males to have had a HBV test (OR = 0.7, 95% CI = 0.6-1.0). Regarding age, the highest rate of ever testing was found among Chinese aged 40 to 50 years (72%) and Vietnamese aged older than 50 years (88%). Among the Vietnamese group, people who spoke English at home were less likely to have been tested than those who only spoke Vietnamese (OR = 0.4, 95% CI = 0.2-0.8).

Age was negatively correlated with vaccination among Chinese respondents, but not for Vietnamese (Table 3). Among the Chinese, vaccination uptake also appeared to correlate with time living in Australia, although this was not significant after adjusting for age and sex (OR = 0.7, 95% CI = 0.4-1.2). No associations were found between vaccination and gender or language spoken at home. As would be expected, respondents who had been tested for HBV had much higher chance of having been vaccinated (OR = 3.1 and 9.8 for Chinese and Vietnamese, respectively).

Current Knowledge About HBV

The mean knowledge scores were similar among the Chinese and Vietnamese groups (approximately 6.6 items correct out of 11; Table 1). However, the proportions of respondents with correct

Table 3. Demographic Factors Associated With HBV Vaccination Among Chinese and Vietnamese People in Brisbane

	China-Born[a]			Vietnam-Born[a]		
	Ever Vaccinated			Ever Vaccinated		
	Yes	No/Unsure	OR[b] (95% CI)	Yes	No/Unsure	OR[b] (95% CI)
Gender						
Male	93 (52)	86 (48)	1 (referent)	119 (62)	71 (38)	1 (referent)
Female	136 (52)	124 (48)	1.0 (0.7-1.6)	123 (60)	81 (40)	0.9 (0.6-1.4)
Age (years)						
<40	147 (65)	81 (35)	1 (referent)	99 (59)	70 (41)	1 (referent)
40-50	35 (51)	33 (49)	0.6 (0.3-1.0)	90 (59)	62 (41)	1.0 (0.6-1.6)
>50	40(30)	94 (70)	0.2 (0.1-0.4)	69 (65)	37 (35)	1.3 (0.8-2.3)
Time living in Australia (years)						
≤10	173(60)	116 (40)	1 (referent)	89 (56)	70 (44)	1 (referent)
>10	51 (35)	93 (65)	0.7 (0.4-1.2)	170 (63)	99 (37)	1.2 (0.7-1.8)
Language spoken at home						
Home language only	198 (52)	185 (48)	1 (referent)	228 (61)	146 (39)	1 (referent)
English (± other language)	31 (56)	24 (44)	1.0 (0.5-1.8)	29 (58)	21 (42)	0.8 (0.4-1.5)
Having been tested for HBV						
No/unsure	67 (39)	106 (61)	1 (referent)	19 (23)	65 (77)	1 (referent)
Yes	162 (61)	102 (39)	3.1 (2.0-4.8)	240 (70)	102 (30)	9.8 (5.3-17.9)

Abbreviations: HBV, hepatitis B virus; OR, odds ratio; CI, confidence interval.
[a]Total varies because of missing values
[b]Odds ratio between "yes" versus "no"/"unsure" to ever vaccinated for HBV, adjusted for age and sex.

HBV knowledge on each knowledge item varied considerably (see Figure 1). Approximately 50% of Chinese and Vietnamese respondents were unaware that hepatitis B could be transmitted through unprotected sex. Within the Chinese group, males had lower knowledge about the sexual transmission risk than females (41% vs 56%, $P = .001$) and those younger than 40 years were less likely to be aware of this risk than the older people (44% vs 55%, $P = 0.02$).

Only 23% of Chinese and 32% of Vietnamese respondents knew that sharing food and drink did not spread the hepatitis B virus (Figure 1). Awareness about the nature and progression of the disease was higher. Significantly more Vietnamese than Chinese knew that HBV infection could be asymptomatic or could lead to cancer, whereas more Chinese than Vietnamese identified the disease as life-long and that treatments were available.

Among the Chinese sample, there was a trend for those with a history of testing to have better knowledge than those who had never been tested for HBV (mean knowledge score difference 0.38, $P = .06$). Similarly, Chinese respondents who had been vaccinated demonstrated a significantly better knowledge score than the nonvaccinated Chinese (mean knowledge score difference 0.77, $P < .001$). However, there was no significant association between current knowledge and prior testing or vaccination practices among Vietnamese respondents.

Preferences in Accessing HBV-Related Information

When asked about language preferences for receiving HBV information, 54% of the Chinese respondents indicated Chinese, 39% both Chinese and English, and 7% English. Among Vietnamese respondents, 70% preferred Vietnamese, 20% both Vietnamese and English, and 10% English. In the Chinese group, the most commonly cited sources used to seek HBV information were the

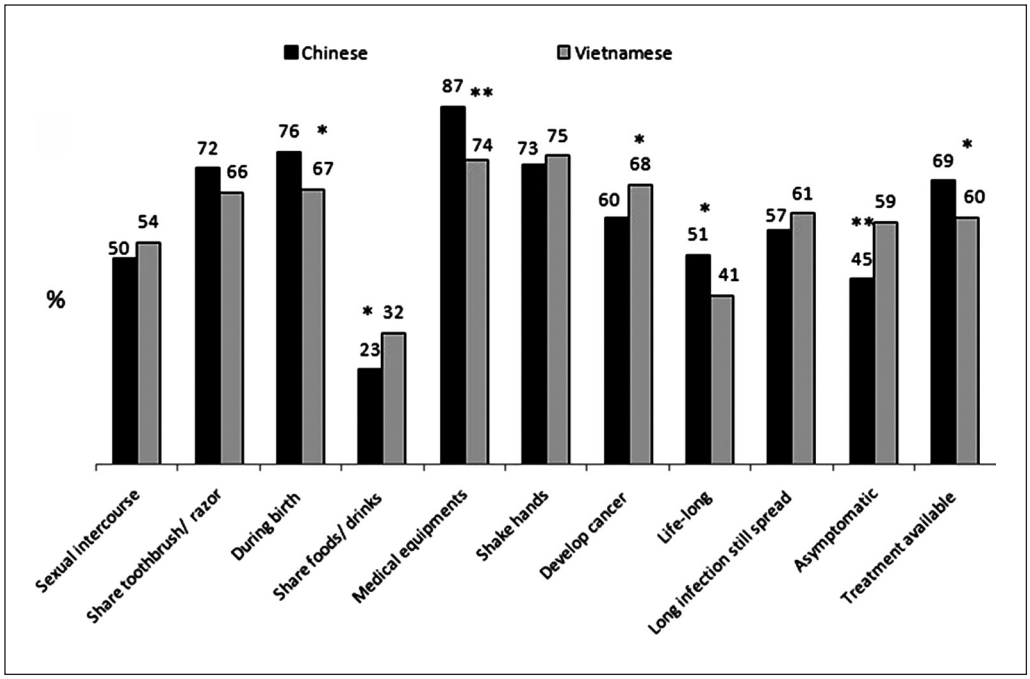

Figure 1. Proportion of people with correct knowledge on different aspects of hepatitis B infection, comparison between Chinese and Vietnamese
*Significant difference with $P \leq .01$. **Significant difference with $P < .001$.

Internet (57%), doctor (17%), hospital/clinic/health services (9%), and newspaper/magazine (9%). In contrast, the preferred source of advice for the Vietnamese was medical practitioners (57%), the Internet (14%), hospital/clinic/health services (11%), newspapers (11%), and the radio (5%).

Discussion

Despite the importance of HBV to the health of Chinese and Vietnamese groups in Australia, knowledge of this virus within the affected communities could best be described as moderate regarding most aspects of HBV and quite poor in some areas. Of particular concern was the low awareness of sexual transmission, with only 1 in 2 (52%) correctly identifying this as a risk. This is at the lower end of the range of estimates reported by similar studies of migrant populations in the United States and Canada,[12-14,22] though somewhat higher than the 44% found in one recent survey of Vietnamese men in Sydney.[6]

The study has generated insights that may be useful for community education and disease prevention campaigns. A minority of Chinese (1 in 4) and Vietnamese people (1 in 3) correctly identified that sharing food and drinks would not spread hepatitis B. This finding is quite consistent with other studies among migrant populations in North America.[12-14,16] Such misinformation was also reported among HBV patients in the National Hepatitis B Needs Assessment in Australia.[23] It appears that many Asia-born people associate HBV with sanitation conditions, sharing foods and drinks, and thus there is confusion with hepatitis A and E infections.[23]

Approximately 1 in 3 respondents was not aware of the severity of HBV infection as a cause of liver cancer. This confirms patterns found in other studies conducted among Vietnamese populations.[15,16,18]

However, knowledge of this aspect of HBV in the current Australian sample was comparatively lower than that reported in studies among Chinese in North America.[12-14] Furthermore, fewer respondents in this study knew that hepatitis B infection can be asymptomatic compared with many other studies.[11-13,22] The consequences of these misconceptions and the confusion between hepatitis B and less life-threatening, nonchronic hepatitis conditions are important. Such misunderstandings may reduce the likelihood of people seeking preventive actions such as testing, vaccination, or monitoring and treatment if they are infected.[24]

Over two thirds of the vaccinated respondents in the Chinese sample had received their vaccination in mainland China, Taiwan, or Hong Kong, whereas less than one fifth of the vaccinated Vietnamese respondents received this in Vietnam. This difference might reflect the history of immigration of the Vietnamese and Chinese people to Australia. The majority of Vietnamese migrants were refugees between 1975 and 1995. During this time, HBV vaccination was relatively unavailable in Vietnam. Conversely, many Chinese migrants have come to Australia more recently (within the past 10 years) and received vaccination before departure.

It is interesting that self-reported testing and vaccination rates in our sample appear somewhat higher than those reported in North America.[12-16,19,20,22] For example, self-reported rates of both testing and vaccination are around 20% lower in one survey of North American Vietnamese.[20] However, another household survey reported a testing rate of 67% in this subpopulation.[22] For Chinese people surveyed in Australia, the reported rates were above the upper bound of estimates on testing (60% vs 37% to 57%) and especially for vaccination (52% Australia versus 31% to 38% North America).[12-14] The apparently higher testing and vaccination uptake among Vietnamese and Chinese in the current Australian sample might be a result of more extensive government efforts to deliver public health care services for migrants in this country.[25]

Despite these generally positive findings regarding preventive actions, nearly 1 in 4 Chinese and 1 in 7 Vietnamese respondents did not recall either having been tested or vaccinated. Clearly, there is a need for further efforts by health professionals to assess the risk of HBV infection among Asia-born people, and give appropriate testing and vaccination information. This is especially the case for those who reported prior vaccination but not testing and those without either previous testing or vaccination, which together account for between 20% and 40% of the Vietnamese and Chinese respondents. As expected, respondents who had been tested or vaccinated demonstrated better knowledge about the disease than those without these actions, although this was only significant in the Chinese sample.

The marked difference in the rate of self-reported HBV infection between the Chinese and Vietnamese group in this study seems inconsistent with the current estimates of prevalence in these two ethnicities in the literature (approximately 10% to 11% for both Vietnam-born and China-born community in Australia[4]). The self-reported rate of Vietnamese respondents in the current study (11.6%) was similar to this estimate, though lower than the prevalence found in some studies among communities living in Vietnam.[26,27]

For the Chinese respondents, the prevalence of 3.5% was half that of a recent national estimate in China (7.2%)[28,29] and also lower than the self-reported rates in other countries.[12-14] It is possible that some Chinese respondents were unwilling to disclose their HBV-positive status because of a fear of discrimination and stigma as suggested elsewhere,[30] although there is no apparent reason to consider why such factors might differentially influence disclosure by Chinese compared with Vietnamese respondents. Another possibility may be a greater reluctance by Chinese people to access health services for testing and diagnosis, a behavior noted for other medical conditions such as cerebrovascular disease.[31]

This study has several implications for public health interventions. It seems clear that most Vietnamese people surveyed in this Australian city prefer their home language and prefer their doctors as main providers of HBV information. This was also indicated in a qualitative study

among Vietnamese women in Brisbane who were reliant on their Vietnamese doctors for general health information.[32] This finding emphasizes the responsibility of physicians to provide accurate and sufficient HBV-related information for the patients during their consultations. Certainly, these practitioners should be equipped with appropriate training or supplementary information. For the Chinese respondents, the Internet was the most common source of information, although this trend might have been partly influenced by the fact that more Chinese were in the younger age band compared with the Vietnamese. Nevertheless, this suggests a potential opportunity for web-based education campaigns on HBV targeting young Chinese migrants, as suggested in the area of HIV prevention and sex education.[33,34] Online health resources can be very effective for people with limited English proficiency,[35] particularly for sensitive issues such as hepatitis B and sexual transmission.[36]

One significant limitation of this study was the use of convenience sampling, which raises questions about the generalizability to the population.[37] Because of the sensitive nature and stigmatization of being HBV positive, it could be anticipated that some people with HBV infection would have been reluctant to participate in filling out a questionnaire in an open community setting. As a result, the HBV infection prevalence may be inaccurate. There may be similar inaccuracies concerning testing and vaccination rates as these relied on self reported recall. It is reasonable to expect that respondents may be mistaken as to the nature of previous blood tests or injections.

Another weakness was that the (necessarily brief) questionnaire did not include a number of important sociodemographic variables that are known to be potential confounders in analysis of health knowledge and practices, such as education level, marital status, or socioeconomic status.

The lack of an Australia-born control group restricted us in making comparisons between the Vietnamese and Chinese sample and a third European-based population. Consequently, we are unable to make definitive statements as to levels of knowledge and awareness compared with the overall population.

Conclusion

The considerably high risks of hepatocellular carcinoma among people in Australia who were born in China and Vietnam[5] underscore the need for evidence-based health promotion and health services for these communities. This study adds to the scant local information for identifying potential guides for intervention. Certainly, better factual education for people with HBV and their communities, continued efforts to promote testing and vaccination, and enhanced support for general practitioners are warranted to improve awareness and practices for prevention, care, and treatment.

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Declaration of Conflicting Interests

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