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A Mixed-Methods Study on Hepatitis B Perceptions and Knowledge among Asian Americans

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A Mixed-Methods Study on Hepatitis B Perceptions and Knowledge among Asian Americans

By

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B.A., University of Iowa, 2016

Thesis Committee Chair: Vincent Marconi, MD

An abstract of
A thesis submitted to the Faculty of the Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
MPH in the Hubert Department of Global Health
2018

Abstract

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By Caitlyn C. Kavan

In the discourse and scholarship surrounding viral hepatitis, we often focus on hepatitis C (HCV) and the populations that are affected by this condition. Hepatitis B (HBV) and its negative effects on Asian Americans is not as widely studied despite the literature that supports that hepatitis B disproportionately affects Asian Americans (AA). Many Asian Americans, whether they were born in Asia, in the United States, or have parents who were born in Asia, are often unaware of their hepatitis B status. Additionally, AAs are unaware about symptoms that could be linked to a possible hepatitis B infection, transmission, and prevention. The goal of this study is to explore Asian Americans' awareness and knowledge of hepatitis B—a chronic condition that affects 1 in 12 Asian Americans.

This mixed-methods study explores hepatitis B awareness and knowledge among Asian Americans. A total of 15 in-depth interviews were conducted with Asian Americans from across the United States. Secondary quantitative data in the form of anonymous online questionnaires and screening results were used to assess baseline knowledge of hepatitis B and hepatitis B status. A qualitative approach was used because of the potential sensitive nature of discussing hepatitis B and we wanted to obtain rich information that in-depth interviews would be able to provide. A quantitative approach was used to obtain descriptive statistics about hepatitis B knowledge and infection rates. All interview responses and quantitative data were compiled and organized according to similarities and differences in knowledge and common keywords used when talking about hepatitis B.

Overall, AAs did not show a strong sense of confidence in their knowledge of hepatitis B. Some mentioned that HBV affected AAs and that it is a concerning health issue among AAs. Some of the major risk factors mentioned include: frequent alcohol consumption and consuming contaminated foods. A majority of AAs believed that in order to increase awareness and knowledge about HBV, we must address linguistic and cultural barriers, collaborate with community leaders, and utilize social media platforms like ethnic media, Facebook, and newspapers. Increasing knowledge can be helpful in increasing screening and vaccination rates among AAs.

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Introduction

Hepatitis B is a disease that causes chronic infection of the liver and disproportionately affects Asian Americans and Pacific Islanders (AAPI) (CDC, 2014, 2016a). Hepatitis B is also the primary cause of liver cancer (hepatocellular carcinoma or HCC) which is the 2nd leading cause of cancer deaths in the world with an estimated 1 million deaths each year (Hepb.org, 2018b). There are five types of viral hepatitis: A, B, C, D, and E (CDC, 2016b). In the United States, the most common types of viral hepatitis are hepatitis A, B, and C (CDC, 2016b). Hepatitis A often appears as a new or acute infection and not a chronic infection whereas hepatitis B begins as an acute infection and often progresses into a chronic infection which can later cause long-term liver issues (CDC, 2014, 2016b). The risk of an acute hepatitis B infection of turning into a chronic infection depends on the age at which an individual is infected. For example, in adults 19 years and older, there is a 5-10% chance that a chronic infection will occur. The risk of developing a chronic infection exponentially increases to 90% if infants are infected at birth (CDC, 2016b).

This study focuses on hepatitis B and how it disproportionately affects Asian Americans. Currently, more than 50% of all chronic hepatitis B infections in the U.S. occur among Asian Americans (Hepb.org, 2018b). There are a variety of measures and treatment options for hepatitis B such as screening and vaccines. For example, rates of acute hepatitis B infections in the United States have decreased since 1991 due to the implementation of hepatitis B vaccinations for children (CDC, 2016a, 2016b). Even with the implementation of routine hepatitis B vaccinations, 1 in 12 Asian Americans will become infected with hepatitis B (CDC, 2016a; Hepb.org, 2018b). The main question that this study will attempt to answer is what is the perception, awareness, and knowledge of hepatitis B among Asian Americans? This study aims

to 1.) learn about how Asian Americans perceive hepatitis B, 2.) evaluate Asian Americans' baseline knowledge and awareness of hepatitis B, and 3.) identify better ways hepatitis B education can be provided to Asian Americans.

We used both qualitative and quantitative methods to collect and analyze data. The primary qualitative method used for this study were 15 audio-recorded in-depth interviews with Asian Americans from across the U.S. This method was used to gain insight on the perceptions and knowledge of hepatitis B and to examine the existing hepatitis B knowledge gap. Secondary quantitative data was also included in the form of secondary anonymous online questionnaires and de-identified hepatitis B screening data collected by the Center for Pan Asian Community Services in Atlanta, GA. The Hepatitis B Foundation states that hepatitis B is a “global health threat and “the world’s most common serious liver infection” (Hepb.org, 2018b). By identifying the factors that contribute to the high hepatitis B infection rates among Asian Americans, we can begin to devise ways in which we can begin to educate Asian Americans about this condition, improve the quality of life of those infected, and ultimately save lives.

Literature Review

Hepatitis B Clinical Features

Viral hepatitis is a condition that causes inflammation of the liver—a vital organ that processes nutrients, filters the blood, and fights off infections (CDC, 2016a). Hepatitis B symptoms are often asymptomatic which can make detecting symptoms difficult. Asian Americans or persons who think they may have a hepatitis B infection should be aware of the following symptoms: loss of appetite, nausea, fatigue, vomiting, jaundice (yellowing of the skin and eyes), dark urine, clay colored or light colored stools, abdominal pain, enlarged liver, and

occasional skin rashes or joint pain (CDC, 2014; UCLA, 2017). Hepatitis B can cause an acute infection that often develops into a chronic infection quickly if left untreated. Individuals with an acute infection may not present symptoms immediately and can unknowingly spread the virus to other people around them. If symptoms occur with an acute infection, they usually appear between 2 weeks and 6 months after exposure to the virus (CDC, 2016b). In the case of children who are four years of age or younger and newly infected adults, hepatitis B symptoms are not noticeable or asymptomatic (CDC, 2014, 2016b). Individuals with chronic infections can remain asymptomatic for as long as 20 to 30 years (CDC, 2016b).

Although there is a variety of ways that a person can develop hepatitis, the most common cause of hepatitis is a virus (CDC, 2016b). Of the five types of hepatitis, hepatitis B disproportionately affects Asian Americans and Pacific Islanders (AAPI) and is 100 times more contagious than HIV (Hepb.org, 2018b). It is estimated that 850,000-2.2 million people are living with chronic hepatitis B and about 19,200 new infections occur each year (CDC, 2016b). 1 in 12 Asian Americans are affected by this disease and even though AAPIs make up less than 5% of the U.S. population, AAPIs account for about 50% of chronic hepatitis B cases in the U.S. (CDC, 2016a; Hepb.org, 2018b). This disease is often referred to as the “silent killer” because many people who are chronically infected do not know that they are infected. At least one-third of Asian Americans are unaware about their hepatitis B infection (CDC, 2016a). This “silent killer”, if left untreated, will lead to liver cancer and cirrhosis. Liver cancer is a complication of hepatitis B and is the leading cause of mortality among Asian Americans (CDC, 2016a).

Transmission

This highly contagious condition has many different modes of transmission. Hepatitis B can be transmitted through sexual contact, sharing needles, sharing razors or toothbrushes with

contaminated blood, having contact with infected bodily fluids and more commonly, hepatitis B can be transmitted perinatally (CDC, 2016b; WHO, 2017). Approximately 75% of all cases of chronic hepatitis B infections are in Asia. This can be attributed to vertical transmission during birth (CDC, 2016a; Hepbtaskforce.org, 2018). Since the most common mode of transmission among Asian Americans is from mother-to-child, children who are infected at birth have the ability to continue to infect their offspring and the cycle of hepatitis B is likely to continue unless proper interventions are implemented. Children born from chronically infected mothers have a 90% likelihood of developing a chronic infection that will likely lead to liver cirrhosis and death in 15%-25% of individuals if left untreated (CDC, 2016b; Hepb.org, 2018b; WHO, 2017). Hepatitis B virus (HBV) is a resilient virus as it is able to retain its infectivity and survive outside of the body for approximately seven days (Hepbtaskforce.org, 2018). Without early detection of this disease, 1 in 4 Asian Americans with hepatitis B will die from liver failure or complications associated with liver cancer (Lu et al., 2015).

In addition to informing Asian Americans about the various ways in which hepatitis B can be transmitted, it is also important to demystify ways in which hepatitis B cannot be transmitted. Hepatitis B is highly infectious but people are not at risk of contracting the disease from casual contact. For example, hepatitis B cannot be transmitted through consuming food or water, sharing meals or utensils, or through breastfeeding (CDC, 2014, 2016b). Demystifying ways in which hepatitis B is not spread can aid in eliminating the stigma surrounding the disease. The lack of knowledge about how hepatitis B is spread has played a major role in the low rate of hepatitis B screenings among Asian Americans (Hu, Pan, & Goodwin, 2011).

Treatment

Currently, hepatitis B has no cure. Fortunately, it is a condition that can be managed with antivirals, supportive care, and regular monitoring. Doctors recommend that individuals with short-term, acute infections try to maintain healthy lifestyles by consuming nutritious foods, avoiding alcohol, and getting adequate amounts of rest (CDC, 2016b). Individuals with chronic hepatitis B infections (CHB) can benefit most from regular monitoring of liver disease. There is no medication currently available to treat acute infections but several medications have been approved to help treat chronic infections (CDC, 2016b). Few studies have been done to look at the effectiveness of using antiviral drugs such as entecavir and tenofovircan to treat chronic infections. A study done by Lok et al., showed that individuals infected with the HBV virus were able to achieve a reduction in mean HBV DNA (undetectable hepatitis B virus) and improved overall liver histology after one year of entecavir treatment (Lok et al., 2012). Regular monitoring of chronic infections can aid in tracking liver disease progression. The goal of CHB treatment is to suppress hepatitis B virus replication and to achieve a sustained genetic barrier to the virus (Lok et al., 2012). The best predictor of sustained remission off treatment is HBsAg (HBV surface antigen) loss, but this is infrequently achieved with the current treatment methods. An immunological cure may be possible if patients are able to sustain HBsAg loss and HBV DNA suppression (Terrault et al., 2016). New drugs to assist in treating CHB are still in development but not all individuals with CHB will need to be on medication as these drugs may cause side effects (CDC, 2016b; Terrault et al., 2016; Yuen et al., 2011).

Hepatitis B (HBV) Screening

As a preventative measure, prompt screening and testing of Asian Americans and individuals who come from an Asian country is strongly encouraged. According to the

University of California, Los Angeles, individuals who do not undergo screening and are unknowingly living with hepatitis B are estimated to be among the 1 in 4 individuals who develop liver cirrhosis or liver cancer (UCLA, 2017). Screenings can aid in the early detection of potential hepatitis B infections which in turn can help reduce the chances of developing liver cirrhosis or liver cancer. Asian Americans, even if they do not feel sick or present any symptoms, are strongly recommended to undergo hepatitis B screening which is a simple process that includes taking a blood sample.

In studies that examined hepatitis B testing barriers, rates, and results among Asian Americans, researchers found that testing rates were generally very low. When looking at ethnic differences in prevalence and barriers of HBV screening among Asian Americans, Strong et al., found that of the 877 participants, less than half (47%) reported to have received a HBV screening, only 38% of participants reported to have received a HBV vaccination, and only 19% received the full three doses of the HBV vaccine (Strong, Lee, Tanaka, & Juon, 2012). Chinese participants demonstrated the highest self-reported screening prevalence (54%) (Strong et al., 2012). A major reason why screening and vaccination rates are extremely low among Asian Americans is due to the lack of HBV vaccination recommendations from primary care providers (Strong et al., 2012). In another study conducted by Pollack et al., participants who tested positive for HBV shared common determinants. Nearly half of the Asian Americans (49%) were born in Asia and of the 4,301 newly screened participants, 13.3% were tested positive for the hepatitis B surface antigen (HBsAg) (Pollack et al., 2014). In another study that focused on improving hepatitis B vaccination compliance among Asian Americans, Juon et al., separated participants into interventions and control groups where the intervention group received resources on where to get free vaccinations and reminder calls. Juon et al., found that those in the

intervention group were more likely to complete the 3-series HBV vaccination (51%) versus 15% in the control group. An important factor as to why this intervention worked was because Asian Americans were given constant reminders and encouragement to get vaccinated from friends, family members, and primary care doctors (Juon, Strong, Kim, Park, & Lee, 2016). In a similar study conducted by the CDC and Bastani et al., researchers found that in order to effectively increase screening and vaccination rates among Asian Americans, culturally specific interventions must be used (Bastani et al., 2015). Implementing culturally tailored education programs that allow Asian Americans to learn about HBV infection and liver cancer risks will allow for better community outreach. Hu et al., concluded that limited English proficiency, low socioeconomic status, and low educational status acted as barriers for Asian Americans and contributes to the low screening vaccination rates (Hu et al., 2011). Similar to the intervention performed by Juon et al., cultural barriers can be overcome by making in-language resources more accessible to Asian Americans and encouraging Asian Americans to get screened. Acknowledging that each Asian subgroup has unique needs and cultural beliefs is crucial in devising a way to increase vaccination and screening rates among high-risk individuals.

Screenings are a necessary prevention tool because screenings allow us to determine if the hepatitis B vaccine was effective in creating immunity or if a person has an acute or chronic infection. The screening process detects three hepatitis B antigens: surface antigen (HBsAg), hepatitis B surface antibody (anti-HBs or HBsAb), and hepatitis B core antibody (anti-HBc or HBcAb) (**Table 1**).

HBV Vaccine Efficacy and Vaccine Coverage among Asian Americans

Hepatitis B is a vaccine-preventable disease. The hepatitis B vaccine has been available since the early 1980s but HBV infection continues to affect about 240 million people globally with the highest rates of infection in Asia and Africa (Iida-Ueno, Enomoto, Tamori, & Kawada, 2017). The vaccine is given in three doses over a time span of six months and in order for the vaccine to protect an individual from the hepatitis B virus, all three doses must be administered (Kim, 2009). The hepatitis B vaccine, if properly completed, is highly effective in providing greater than 90% protection to infants, children, and adults immunized before being exposed to the virus. An estimated 5-15% of vaccinated individuals can still become infected because immunity was not acquired (CDC, 2014; Hepb.org, 2018a). A hepatitis B vaccine “non-responder” refers to an individual who does not acquire protective surface antibodies after receiving two full series of the hepatitis B vaccine (Hepb.org, 2018a). CDC recommends that persons who do not respond to the hepatitis B vaccine series complete a second 3-dose series and then tested for immunity 1-2 months after the last shot of the series (Hepb.org, 2018a). It is vital that individuals, despite having been vaccinated, to undergo screening where blood is drawn and analyzed for protective antibodies.

In studies looking at overall vaccination rates and coverage across racial and ethnic groups, Asians were among the least likely to receive Pneumococcal, Td, and HPV vaccines compared to other racial groups (Lu et al., 2015). First-generation Asian Americans carry most of the disease burden of hepatitis B and most are unsure of their HBV vaccination status (Lu et al., 2015). Hepatitis B is endemic in most of Asian and populations with high rates of infection have shown to originate from East Asia, Southeast Asia, and the Pacific (CDC, 2016b). In countries like China, Vietnam, Korea, and Pacific Islands, hepatitis B is a major issue primarily

due to the low infant vaccination rates (Lu et al., 2015). Pollack et al., found that those who test positive for the hepatitis B surface antigen (HBsAg) shared common characteristics such as nearly half of participants having been born in Asia and having had a family history of hepatitis B (Pollack et al., 2014).

Trends in HBV vaccination are extremely underreported and there is a severe lack of data on HBV vaccination rates among Asian Americans. In the first study to use national data to estimate HBV vaccination prevalence among Asians and Pacific Islanders in the U.S., Ayers et al., suggest that low HBV vaccination rates among Asian Americans may be due to risk perception and structural inequalities show. Ayers et al., found that less-educated, young adult males are the least likely to receive an HBV vaccination. Findings also demonstrate a significantly positive association between education and HBV vaccination (Ayers, Juon, Lee, & Park, 2010). Knowledge of hepatitis B risks may increase vaccination rates among high-risk individuals and reduce the overall disease burden experienced by Asian Americans.

Hepatitis B Prevention and Education

Hepatitis B symptoms are extremely similar to other diseases. Therefore, it is crucial to educate those in high-risk groups about how to detect signs of liver damage and encourage Asian Americans to get vaccinated and screened. An important aspect of prevention is education. Figuring out the best ways to target Asian Americans and provide useful hepatitis B education to Asian Americans has proven to be a challenge. For example, a major barrier in educating Asian Americans about hepatitis B is the limited English proficiency. In an effort to overcome the linguistic barrier, Taylor et al., conducted a group-randomized trial to evaluate the effectiveness of linguistically tailored ESL curriculum for Chinese, Korean, Vietnamese, and Farsi and Punjabi speaking immigrants. Eighty ESL classes were randomized into an experimental group

and a control group where the experimental group received hepatitis B education. 11% of the 80 experimental group students and about 6% of the 100 control group students stated that they had completed a hepatitis B test in the six months after attending the ESL class (Taylor et al., 2011). After follow-up, students in the experimental group were significantly more likely to know that immigrants had higher hepatitis B infection rates. The ESL curriculum provided students with information about the importance of hepatitis B testing for Asians, rates of HBV infection, and HBV transmission routes in their respective languages. Taylor et al., found that linguistically tailored ESL curriculum for Asian immigrants can significantly improve HBV-related knowledge but unfortunately, the ESL curriculum had little impact on HBV testing completion rates (Taylor et al., 2011).

Another study conducted by Lee et al., evaluated the effectiveness of photonovels developed for Chinese, Korean, and Vietnamese American communities in Maryland. Photonovels included community members from each respective community and storylines were developed from themes collected from focus groups. These photonovels were received well by Chinese, Korean, and Vietnamese Americans because each photonovel included familiar faces from each community along with commonly used terms that made the information more easily understood. Evaluation of the photonovels showed that community members demonstrated self-efficacy and intentions to undergo hepatitis B screening (Lee, Yoon, Chen, & Juon, 2013). More than 80% of participants agreed that photonovels were a good teaching tool and those who agreed were more likely to seek out hepatitis B screening opportunities (Lee et al., 2013). Previous studies have shown that hepatitis B information was not received favorably by Asian Americans due to limited English fluency, low health literacy, and cultural beliefs about health and medicine (Lee et al., 2013). Another reason why photonovels were successful in educating

Asian Americans, and more specifically, Asian Americans with lower socioeconomic status, was because the health information was presented without large amounts of text and difficult medical terms. Picture-based instructions helped participants with lower education attainment or limited English fluency understand hepatitis B information (Lee et al., 2013). For example, photonovels were most favorable among Vietnamese Americans as they also were more likely to recommend photonovels to others in their community [**Figure 1**]. Lee et al., makes an important note that unique cultural factors can shape a community's perception of hepatitis B. Therefore, it is crucial to provide culturally appropriate education while also considering language barriers, socioeconomic status, and beliefs about medicine. Self-efficacy and intention have been identified as important determinants of health behavior and photonovels have shown that there is an effective way to provide hepatitis B education to high-risk populations

Methods

This study used both qualitative and quantitative tools to collect and analyze data. For the qualitative aspect of this mixed-methods study, 15 in-depth, audio-recorded, semi-structured interviews were conducted with Asian Americans from across the United States. Due to geographic constraints, all in-depth interviews were conducted over the phone. Interviews varied in duration from 11 minutes to 35 minutes. Participants were asked to share their knowledge and awareness about hepatitis B in the Asian American community and other topics like vaccine efficacy and general positive health behaviors. Potential participants recruited through all three sampling techniques were given a brief summary of the study, a copy of the oral consent form, and allowed to ask questions and given the opportunity to participate or not in the study. Participants were recruited using four different methods: convenience sampling, purposive sampling, and snowball sampling. Convenience sampling is a type of non-probability sampling

that relies on collecting data from a population that is easily accessible to the main researcher. The main researcher had access to a pool of Asian Americans in different states across the United States and six participants were recruited using convenience sampling. Purposive sampling is another non-probability method that is based on shared characteristics of a population. Homogenous purposive sampling was used to reach a target population. In this study, our target population was Asian Americans because we are focused on exploring Asian Americans' perceptions and awareness of hepatitis B in the Asian American community. Participants were found by directly contacting directors and presidents of Asian-interest organizations like sororities, fraternities, non-profit organizations, and cultural groups. All organizations were contacted via an IRB-approved email. Four participants were recruited using purposive sampling. Snowball sampling is a method where study participants recruit other potential participants for a study. It is often used to identify study participants with specific characteristics and this method is based on utilizing existing social networks in the community to recruit participants⁹. After each interview, the PI asked participants if they knew others who would be interested in participating in this study. If participants were able to refer other Asian Americans to the study, the PI informed the participants to share the PI's email address. Five participants were recruited using snowball sampling.

We attempted to recruit at least 25 participants in order to reach data saturation and theoretical saturation. Saturation can be generally defined as a point where no additional data can lead to any new findings or themes (Saunders et al., 2017). Data saturation occurs when new data starts to become redundant of data already collected (Saunders et al., 2017). Theoretical saturation on the other hand, is when no additional insights or themes emerge from the collected data. Theoretical saturation is the point at which gathering more data would not yield any further

insights about the emerging grounded theory (Hennink, Kaiser, & Marconi, 2017). After analyzing the qualitative coding data, we were able to achieve both data saturation and theoretical saturation with 15 participants.

Efforts were made to recruit an equal number of both male and female participants but due to the low response rate during the participant recruitment phase, more females participated in this study than males. Of the 15 participants, 10 identified as female and 5 identified as male. During the recruitment phase, no efforts were made to recruit individuals from different age groups.

Before each in-depth interview began, the main researcher read aloud a scripted consent form to each participant. The scripted consent form informed the participants of the following: the study is completely voluntary and that they can opt out at any time, the interviews will be audio-recorded and later transcribed and then deleted to protect their confidentiality and anonymity, and all identifiable information will be removed. Before starting each interview, the researcher asked the following: 1.) are you comfortable with being audio-recorded and if they wanted to continue participating in the study after being informed about the study procedures 2.) are you around other people at the moment? If so, are you able to go to a private area where you can do this interview in private? Each participant's consent was audio-recorded. Once the main researcher received verbal consent, the audio-recording was started and the interview ensued. None of the participants declined to participate after the consent process and if any participant would have decided to opt out of the study, all of their information would have been deleted and they would be excluded from the study.

All of the in-depth interviews were audio-recorded using QuickTime Player audio recorder on a 2015 MacBook Pro. All interviews took place in a private room selected by the

main researcher. Each audio-recorded interview was transcribed verbatim by the main researcher using a transcription software called Express Scribe. All interviews were transcribed onto individual Microsoft Word documents and saved onto a password protected Apple MacBook Pro that only the main researcher had access to. Each Word document was labeled as [Participant #_Interview]. The interview guide used to conduct the in-depth interviews was designed by the main researcher and was peer-reviewed by other qualitative researchers to ensure that the questions pertained to the main research question, were clear and concise, and were not multifaceted to the point that the participants would not be able to provide an adequate response. After the interview guide was peer-reviewed, the following revisions were made: 1.) quantitative terms were replaced with qualitative terms 2.) academic language such as ‘prevalence’ was omitted and replaced with simpler terms like ‘common’.

The interview guide began with a brief introduction to the study and the interviewer to build rapport. Study participants were given the option to opt out of the study at any point with no penalties. Additionally, the interviewer reassured participants that it was acceptable if they had no prior knowledge of hepatitis B. After rapport was built, each participant was asked the warm-up questions that included general demographic information. The key questions asked included questions about general hepatitis B perceptions and awareness, ways to contract and prevent hepatitis B, vaccine perceptions, and hepatitis B resources in the Asian American community. The interviews ended with a question that allowed participants to share other thoughts, opinions, or stories that may pertain to the topic of hepatitis B. We found that by conducting in-depth interviews, we were able to capture unique stories and perceptions about hepatitis B that we would not have been able to collect if we did not conduct in-depth interviews.

Once the interviews were transcribed using Express Scribe, a codebook and coding tree were created by the main researcher. A coding tree was developed after all the transcripts were coded manually using Microsoft Word. The codes and sub-codes were created by reviewing each transcribed interview and finding common statements, repeated words, and since the study focuses on the participant's perceptions and awareness of hepatitis B, perceptions and awareness codes were created. After a coding tree was created, a preliminary codebook was constructed with the codes and sub-codes in the coding tree. The final codebook was peer-reviewed by four fellow researchers and revised accordingly. The following revisions were made to the codebook: 1.) the sub-code 'parents' was removed because of insufficient data, 2.) a new code titled 'misconceptions' was added to the codebook, 3.) the code 'hepatitis B knowledge' and 'hepatitis B prevalence' were combined as many answers for these two codes were repetitive.

Once the interviews were coded, the next step was to analyze the data that was collected from the in-depth interviews. Three main methods of analysis were used in this study: grounded theory, inductive theory, and social cognitive theory. Grounded theory was employed because this theory allowed us to utilize a process for textual data analysis that enabled an exploration of human behavior, identify social processes, and cultural norms (Hennink et al., 2012). Grounded theory involves conducting a series of repeated and continual tasks that aid in the development of explanatory frameworks and theories (Hennink et al., 2012). In this study, we analyzed verbatim transcripts to gauge the knowledge and awareness of the study participants. Verbatim transcripts allowed us to capture an insider perspective or an emic perspective that helped us understand the participant's perceptions and awareness of hepatitis B through their own words and experiences (Hennink et al., 2012). An example of an emic perspective given by a participant was when they indicated that they decided to avoid consuming too much alcohol because they had observed

their family members develop liver problems from consuming too much alcohol. Due to the cyclical nature of qualitative data analysis, the main researcher went through each transcribed interview multiple times to formulate codes and identify major themes. This task was repeated in order to delve deeper into the data and to find areas of improvement. Throughout this process, we constantly compared interview responses. Constant comparison during the analysis phase helped define and refine major themes and codes that were derived from reviewing each transcribed interview.

Inductive theory can be defined as a process that provides an explanation for how something works as derived from the empirical data (Hennink et al., 2012). This theory helped us create a framework that helped us understand how and why these participants had certain attitudes or beliefs about hepatitis B. For example, we noted that a major factor as to why participants had positive vaccine beliefs was due to their own conducted research into vaccines and their general knowledge about the benefits of being vaccinated. From there we were able to conceptualize the data and link the subcode 'positive vaccine beliefs' to the code 'vaccine attitudes'. We were able to create a framework of understanding by grouping codes together during the codebook development stage (categorization) and identifying empirically supported links between each code (conceptualization) (Hennink et al., 2012). An example of categorization that occurred was when the 'hepatitis b prevalence' subcode was deleted because there was the overarching code 'general hepatitis b knowledge' that was already in existence.

For the quantitative aspects of this study, online questionnaires and surveys conducted by the Center for Pan Asian Community Services (CPACS) in Atlanta, GA were used. These descriptive statistical questionnaires were approved by Hep. B United and de-identified by CPACS before being used in this study. A total of 39 Asian American participants completed the

online questionnaire. The 39 Asian Americans who completed the online questionnaire were not the same participants who participated in the in-depth interviews. Contents of the anonymous online questionnaire included: demographic information such (i.e. highest education level, age, gender), status of hepatitis B vaccine status, general health behaviors that participants routinely do (i.e. annual physical exams), hepatitis B knowledge, liver cancer prevalence in their family, and hepatitis B myths. Secondary screening data collected by CPACS was also used to examine acute or chronic infections, hepatitis b vaccine eligible participants, vaccine-acquired immunity, and immunity acquired from a natural infection. Results of the screening events and online questionnaires were obtained directly from the health programs director at CPACS.

Screening data were collected during various hepatitis B community testing events in the greater Atlanta area by CPACS. All participants who were screened for hepatitis B were different from the participants who participated in the in-depth interviews and the online questionnaires. All screening data were de-identified by CPACS before being used in this study. We were only provided with descriptive statistical screening data.

The online questionnaire data were organized by compiling each response into an Excel Spreadsheet where each response was grouped together by commonalities in answers. For the screening data, we applied descriptive statistical analysis where percentages were already pre-calculated for race/ethnicity and test results. These percentages showed the number of screening participants who had an acute/chronic infection, hepatitis B vaccine eligible participants, those who had vaccine-acquired immunity, and immunity acquired from a natural infection.

Ethical Considerations

According to the Institutional Review Board of Emory University in the United States, this study was determined to be human subjects research. Because this study included human subjects, IRB

approval was required. Protocol and research instruments were submitted to Emory's IRB and expedited approval was granted on October 27th, 2017.

Results

Qualitative Findings

A total of 25 Asian Americans were recruited but only 15 total participants were used in this study due to participants not responding to the study invitation [Table 2]. After coding and analyzing the qualitative data collected from the in-depth interviews, six major themes emerged. The major themes included 1.) Most participants did not show confidence in their hepatitis B knowledge but participants did mention that hepatitis B disproportionately affected Asian Americans 2.) In terms of risky behavior, a majority of participants stated that the most common way to get hepatitis B is from consuming alcohol and from eating unclean or contaminated foods 3.) In terms of prevention, most stated that vaccination would be the best way to protect themselves from contracting hepatitis B 4.) Hepatitis B was not seen by most of the participants as a disease of concern for Asian Americans 5.) The major barriers that hinder Asian Americans from learning about hepatitis B include language barriers, cultural beliefs about disease, and general unwillingness to seek medical services and 6.) When asked about how hepatitis B awareness could be generated, participants expressed that in-language media platforms should be used along with a collectivist, community-oriented approach. These themes were formulated after reviewing the codebook and comparing the similarities in responses across the 15 interviews. The first theme emerged when participants were asked to talk about their knowledge and awareness of hepatitis B. A majority of participants were able to demonstrate a general understanding of the condition but not with strong certainty. Even though participants showed a general lack of confidence in their hepatitis B knowledge, participants were certain that hepatitis

B disproportionately affected Asian Americans [Table 3]. The second theme was established because the participants shared that in regards to risk behaviors, alcohol consumption or over consumption of alcohol and the consumption of contaminated foods played an important factor in poor health outcomes and the manifestation of hepatitis B. With regards to alcohol consumption, some participants shared that due to personal experiences, they felt that alcohol was a major risk factor [Table 3]. The third theme emerged because the participants shared a strong belief in the efficacy and effectiveness of vaccines to prevent and protect individuals from contracting hepatitis B. Along with this shared positive belief in vaccines, participants were able to share that they had received the hepatitis B vaccine but with varying degrees of certainty. The fourth theme emerged after participants were asked about diseases that they thought were prevalent in the Asian American community. Also, they were asked if they thought that hepatitis B was a concern for Asian Americans. Despite stating that hepatitis B disproportionately affects Asian Americans, a majority stated that conditions such as high blood pressure, high cholesterol, and mental health issues were the most prevalent health issues affecting Asian Americans and hepatitis B was not a major concern [Table 3]. The fifth theme was established after participants were asked about existing barriers that hinder Asian Americans from learning about hepatitis B or utilizing hepatitis B services such as testing. The lack of English proficiency among older Asian Americans was mentioned along with traditional beliefs about disease. Participants shared that the belief that a person is seen as “broken” if they have a physical or mental illness played a crucial role in why Asian Americans are apprehensive about seeking and using hepatitis B resources [Table 3]. The sixth theme emerged after participants shared that in order to effectively educate Asian Americans about hepatitis B, a collectivist and community-oriented approach needs to be used. Participants shared that the Asian American community moves as a

group and therefore targeting Asian Americans using individualistic approaches will not be as effective [Table 3].

Overall, the preliminary findings suggest that in regards to the perception of disease burden and hepatitis B severity, all of the participants had unique perspectives and outlooks on the disease in their own respective communities. Despite most participants stating that hepatitis B disproportionately affects Asian Americans, a majority believed that it was not a disease of concern. For example, a participant who identified as being a 2nd generation Indian American and a certified EMT stated that it was not an issue that was of concern for them or their community.

“I feel like it’s not a huge concern for me personally and for the people around me.”

She attributed this lack of concern to her upbringing and shared that health issues were not often talked about in the Indian American community due to certain cultural beliefs and standards that prevented opportunities for open dialogue to occur about health issues.

“But like I said it-it [hepatitis B] might be a problem for all I know but I just don’t hear about it. That could also be part of people not sharing their medical information...”

Another participant who identified as being a 2nd generation Korean American and immigrated to the United States at a young age, shared that she was informed about hepatitis B and how it disproportionately affected Asian Americans during her time as an undergraduate.

“I also have friends back home who created an organization dedicated to raising awareness about hepatitis B among Asian Americans so I got a little more information from them...”

This participant also shared an interesting opinion that differed from the other participants. Since this participant was born abroad, they felt that hepatitis B was not as much of an issue in the United States as it is in Asia.

“If I compare it with the frequency with the people living in Asia, I think it’s not as prevalent. I think the people living in Asia experience it a lot more.”

A participant of Chinese, Japanese, and White background shared this same belief that hepatitis B is more of an issue among those living in Asia than among Asian Americans.

“I’m aware that it is a disease that affects Asian Amer-well, Asians at a higher rate.”

Hepatitis B was viewed as a condition that is common contracted through the consumption of alcohol or ingesting contaminated foods. Most participants were unsure of how hepatitis B is commonly spread except for one participant who identified as being a 2nd generation ethnically Chinese and culturally Vietnamese American. This participant showed the most confidence and knowledge about hepatitis B prevalence and how this disease can affect the body.

“I just know that Hep. B is pretty prevalent in the Asian community. I know that it affects the liver, it can lead to liver cancer. So it’s pretty serious and something that is preventative...”

This participant was also able to talk about a common form of transmission when asked to talk about how individuals can contract the disease. The participant was able to talk about this common mode of transmission through their own research and curiosity about hepatitis B and the Asian American community.

“I don’t know how any other way it can be transported... transmitted besides birth... I know that there’s a vaccine for it but I don’t know much about it other than it can passed through birth from mother to child.”

Other participants also shared that through their own research and social networks, they were able to educate themselves about hepatitis B.

“Sometimes it just kinds of comes across online. So like I do a lot of infectious disease research and sometimes I think of it and just look up information about different diseases.”

“Honestly through friends and online resources. I have friends back home who created an organization dedicated to raising awareness about hepatitis B so I got a little more information from them.”

Given the small number of interviews, all of the study findings are preliminary and tentative and would benefit from further research.

Quantitative Findings

Quantitative data was collected by the Center for Pan Asian Community Services (CPACS) in the form of an anonymous online questionnaire and screening event results. All quantitative data was de-identified and permission was received to use the following data in this study. Three hepatitis B screening events were conducted between May 2017 and September 2017 in the greater Atlanta area. A total of 153 people were screened for hepatitis B using the hepatitis B blood panel. One blood sample was taken from each person and analyzed for the following: HbsAG (hepatitis B surface antigen), Anti-HBs or HBsAB (hepatitis B surface antibody), and anti-HBc or HBcAB (hepatitis B core antibody). 9.8% of persons tested were

found to have an acute or chronic infection and referred to clinical care [Table 4]. Of those with an acute or chronic infection, 11.7% were female and 6.8% were male. Of the 153 persons tested, 61.4% identified as being female and 37.9% identified as being male.

A total of 39 Asian Americans completed the anonymous online questionnaire. The questionnaire asked participants a series of questions about general health behaviors, hepatitis B knowledge and risks, and ways in which individuals can contract hepatitis B. Results from the anonymous online questionnaire showed that 46.2% of participants reported that they had been tested for hepatitis B whereas 35.9% of participants had not been tested before. 67.2% participants reported to have received the hepatitis B vaccine and 23.1% were unsure if they had received the vaccine or not. Despite some participants not knowing their vaccine status, 94.4% reported that they felt comfortable talking to their primary care doctors about hepatitis B. On the other hand, only 61.1% of participants indicated that they would feel comfortable talking about hepatitis B with their families [Table 5]. In regards to transmission routes, 97.2% of participants believed that hepatitis B can be spread through sexual intercourse [Table 5]. The next most common way to contract hepatitis B, as indicated by the questionnaire results, is by sharing razors (83.3%) [Table 5]. This was followed by the belief that hepatitis B can be spread from mother to child during childbirth (80.6%) [Table 5]. Over half of the participants believed that hepatitis B can cause some type of liver damage (72.2%).

Discussion

Hepatitis B continues to cause liver complications for Asian Americans who contract the disease either perinatally (mother-to-child), coming into contact with infected blood, or from consuming large amounts of alcohol (CDC, 2014, 2016b). The aims of this study were to 1.) learn about how Asian Americans perceive hepatitis B, 2.) evaluate Asian Americans' baseline

knowledge and awareness of hepatitis B, and 3.) identify ways hepatitis B education can be provided to Asian Americans. The qualitative nature of this study helped us capture an emic perspective that can assist in future studies that aim to understand why hepatitis B disproportionately affects Asian Americans.

Hepatitis B Knowledge

From the preliminary qualitative findings of this study, a majority of participants demonstrated limited knowledge about hepatitis B. In addition to the lack of knowledge, participants generally had a lack of confidence in their responses. Interestingly, without prompting, a majority of participants shared that they had knowledge that hepatitis B disproportionately affected Asian Americans. When asked to describe how they obtained this knowledge, participants shared that they learned that hepatitis B disproportionately affects Asian Americans from various student organizations on their college campuses, through independent research, and from hearing others talk about hepatitis B within their social networks. For example, some participants shared that through the philanthropy work that they participated in through fraternities and sororities, they were able to learn about the high infection rates among Asian Americans. Additionally, 72.2% of online questionnaire participants and all in-depth interview participants agreed that hepatitis B can cause liver damage. Our findings showed that all of the individuals who participated in the in-depth interviews showed varying levels of certainty when talking about the different aspects of hepatitis B -- whether discussing the symptoms, modes of transmission, or prevention methods. The in-depth interview participants did not have chronic hepatitis B infections but the lack of confidence conveyed in the participants' responses align with existing literature that demonstrate that one-third of Asian

Americans living in the United States are unaware of their chronic hepatitis B status or unaware about the disease as a whole (CDC, 2014, 2016a; Hepbtaskforce.org, 2018).

Hepatitis B Risk Factors

Examining the risk factors that were identified by the in-depth interview participants and the online questionnaire participants, we found varying answers among qualitative and quantitative participants. Consuming alcohol and contaminated food and water were identified by approximately 50% of interview participants as substantial risk factors that could result in transmission of hepatitis B. However, only 19.4% of online questionnaire participants thought that hepatitis B could be spread from consuming contaminated food. 97.2% of online questionnaire participants expressed that hepatitis B can be spread through sexual intercourse.

Participants who expressed that alcohol consumption was a major risk factor for hepatitis B shared that due to their personal experiences of witnessing family members developing liver issues from consuming large amounts of alcohol, they felt that alcohol consumption was a particularly harmful behavior. Participants reported that consuming contaminated food or water could put a person at risk of contracting hepatitis B, also shared that they may be confusing hepatitis A risk factors with hepatitis B risk factors. Participants were not able to differentiate between hepatitis A and hepatitis B risk factors.

Hepatitis B Protection Methods

Of the 153 Asian Americans who were screened for hepatitis B, 24% of individuals acquired immunity from an HBV vaccine and 26.7% of screened individuals were found to be susceptible and vaccine eligible. More than half of the in-depth interview participants shared that the best way to protect oneself from hepatitis B is to get vaccinated. A majority of in-depth

interview participants (>50%) reported that they believed that they had received the HBV vaccination during their childhood, before they immigrated to the U.S., or during their early adult years. When asked to elaborate on their views on vaccine efficacy and effectiveness, a majority of in-depth interview participants had highly favorable opinions on vaccines and their ability to reduce various diseases. Participants also talked briefly about how misconstrued information regarding vaccines can negatively affect how Asian Americans go about deciding on getting vaccinated. Participants also shared that although they had highly favorable opinions about vaccines, they would not pressure others to get vaccinated. As indicated by a majority of in-depth interview participants, they did not feel that it would be appropriate to “force” others to vaccinate themselves or their children. Participants suggested that individuals who have not been vaccinated or are apprehensive about vaccines, should do their research and to consider the benefits of vaccinations. Another important prevention method that in-depth interview participants shared was to reduce the consumption of alcohol. This stems back to the belief that alcohol can negatively affect the liver and therefore, by reducing or eliminating alcohol completely from one’s diet, an individual can be protected from liver damage.

Asian American Health Issues

As previously mentioned, a majority of in-depth interview participants said that hepatitis B disproportionately affects Asian Americans. Though hepatitis B was identified as a health issue for Asian Americans, participants did not feel that hepatitis B too precedence over other health conditions. Hepatitis B was not viewed as a health priority among Asian Americans because of the lack of conversations about hepatitis B. Many participants expressed that because of social stigma, privacy issues, and of how their families viewed health and disease, participants were not able to talk about hepatitis B. When participants try to start conversations about

hepatitis B, their family members will often disengage or change the subject. Most stated that health issues were not acceptable to talk about because of denial or the potential shame that could be placed on their families.

Many participants stated that mental health as a whole and issues such as depression and anxiety are issues that Asian Americans need to acknowledge more than hepatitis B. Mental health is often not discussed within the Asian American community because of the stigma associated with mental health issues and the belief that conditions like depression are not “real” health issues. Along with mental health being a major concern, high blood pressure (HBP) and high cholesterol were also deemed concerning by a majority of participants. HBP and high cholesterol were thought to be associated with the traditional foods that some Asian Americans consumed. Stomach and breast cancer were also mentioned as being health issues that Asian Americans should be worried about. For example, one participant shared that they learned that among the various kinds of cancer, breast cancer affected Asian women the most. Another participant shared that from their personal experience and international travels to Asia, they were made aware of the dangers of stomach cancer for Asian Americans. Overall, participants felt that if they knew more about hepatitis B and had more opportunities to talk about it, they would feel more inclined to focus their attention on it.

Collectivism, Cultural Beliefs, & Linguistic Barriers

When it comes to understanding why there is an existing knowledge gap about hepatitis B, we must examine the language and cultural barriers that exist within the Asian American community and use a collectivistic, community-based approach. Participants expressed that they felt that there was a severe lack of culturally relevant and in-language resources that Asian Americans, especially older Asian Americans, could utilize to learn about hepatitis B risk

factors, treatment, and prevention. Participants who identified as being 21-25 years of age, shared that they had access to online resources like WebMD, CDC, and WHO factsheets where they educated themselves about hepatitis B. The younger participants expressed a need to engage their parents in conversations about hepatitis B.

94.4% of online questionnaire participants felt comfortable with talking to their doctor about hepatitis B but only 61.1% of online questionnaire participants said that they would feel comfortable talking to their families about hepatitis B. A similar pattern can be seen amongst in-depth interview participants as many of them stated that they would not feel comfortable engaging in conversations about hepatitis B with their family members. A few reasons as to why some participants did not feel comfortable talking about hepatitis B with their families included 1.) generating unnecessary concern, 2.) not having enough knowledge about HBV to begin a productive conversation, and 3.) parents not believing their children or other Asian Americans when hepatitis B information is presented. In addition to these reasons, most of the participants' parents or family members have limited English proficiency which makes information sharing much more difficult.

Cultural beliefs about illnesses and medicine play an important role in how often Asian Americans actively seek out medical care. For example, some in-depth interview participants stated that older Asian Americans often will reject Western medicine and seek out more traditional ways of healing like herbal homemade remedies or consulting a shaman or monk for health advice. Participants shared that there was a difference between the younger and older generation of Asian Americans and that the younger generation were more likely to seek Western-style medicine. One participant who identified as being in their mid-40s, stated that the younger generation must work to educate the older generation of Asian Americans to trust in

Western-style medical practices and to get more frequent health screenings. This same participant, along with others, stated that from their own personal experiences, Asian Americans tend to be more stubborn and do not want to address existing health issues because they are either afraid of being diagnosed with a disease or they do not think they are unhealthy.

Hepatitis B Outreach & Education

A majority of in-depth interview participants shared that one of the most important obstacles to overcome in order to address the existing knowledge gap is the collectivistic way in which Asian Americans tend to function. Participants shared that most Asian Americans in their respective communities, if given the opportunity to attend events like town halls or health screenings, were less likely to go out of their way to participate in these kinds of events. Many in-depth interview participants stated that more Asian American organizations and health care professionals need to go out into different Asian American communities to provide hepatitis B education and vaccines. Many participants shared that we should not expect Asian Americans to want to attend educational workshops but instead, actively go out to events where Asian Americans gather. Some events mentioned by participants included cultural fairs and popular Asian businesses. Building trust and rapport amongst Asian American community leaders like shamans and Asian American healthcare professionals, can assist in promoting hepatitis B screenings and ultimately engage those at risk of developing or contracting HBV.

Another way in which we can begin to increase hepatitis B knowledge and promote positive health behaviors is to utilize in-language media sources like newspapers and television networks. Participants, young and old, shared that they often learned about hepatitis B from online searches and by utilizing other media sources. Participants shared various successful media campaigns that were used to inform Asians and Asian Americans about other health

conditions in Asian and the U.S. One successful health campaign regarding mercury consumption used the help of a famous Chinese athlete to discourage individuals from consuming shark fin soup. Other participants mentioned that their parents often read Indian, Chinese, or Korean newspapers and trusted in the health information published in these in-language resources.

Limitations

This study has a number of limitations that should be considered. The first limitation is the study participants who took part in the in-depth interviews were all interviewed over the phone. Conducting phone interviews did not give us the opportunity to observe each participant's body language or facial expressions. If we had the opportunity to observe the body language of each participant, we could have added richer data and context to our qualitative data. We also experienced dropped calls and poor connection issues during a few phone interviews which disrupted the audio-recording and flow of some interviews. Another limitation regarding participant recruiting that decreased generalizability was the use of convenience and purposive sampling.

The second limitation was that a majority of the in-depth interview participants were between the ages of 21 and 25. The potential reason why the interview participants did not include a greater age range was most likely due to recruiting from sorority, fraternities, and Asian American organizations where a majority of potential participants were young adults between the ages of 19 and 26. More widely distributed age brackets could have given us different perspectives on hepatitis B. In future studies, greater efforts will be made to recruit Asian Americans from different age brackets—preferably Asian Americans who are 35 years and older.

The third limitation is the secondary screening data collected by CPACS. Participants who received hepatitis B testing were all from the Metro Atlanta area. Since these participants were all from Metro Atlanta, screening data may not be representative of all Asian Americans in the United States. Therefore, the screening data used in this study is not generalizable to the greater Asian American population in the U.S. Additionally, the screening data provided by CPACS did not differentiate between acute and chronic infections.

The fourth limitation was the relationship between the main researcher and a majority of in-depth interview participants. Convenience and purposive sampling was used because the main researcher had access to Asian Americans from across the U.S. who showed interest in participating in this study. Participants who were already well-acquainted with the main researcher were more comfortable with sharing their knowledge and thoughts about hepatitis B. Very little prompting was needed to encourage participants to talk about various health topics relating to themselves and their family members. Participants who already had some sort of connection to the main researcher may have biased the study because they were able to speak in greater detail about topics surrounding vaccinations and cultural beliefs about medicine and health. Since participants demonstrated a high degree of trust in the main researcher and in the aims of this study, it did not take a lot of time to build rapport. Participants who were referred to this study had no connection to the main researcher and tended to not speak in detail about their views on vaccinations and their knowledge about hepatitis B.

The fifth limitation was the self-reported hepatitis B vaccination statuses. During the in-depth interviews, participants were asked if they had ever received the hepatitis B vaccine. Some reported that they had received the vaccine but most were unsure if they had received a vaccination for hepatitis B or C. Since these data were self-reported and most participants

expressed a lack of confidence, there was recall bias where participants were not able to accurately recall information regarding their hepatitis B vaccination status. Among participants who self-reported that they had received the hepatitis B vaccine, few were able to confirm if they had received the full three doses.

Delimitations

A variety of methods were implemented in an effort to reduce bias in this study. A mixed-methods approach allowed us to fulfill the research question from more than one point of view. A mixed-methods approach allowed us to compare the self-reported responses and perspectives from the in-depth interviews with the quantitative screening results and online questionnaire. This ability to compare different data sources helped inform us of the gaps in knowledge that exist among Asian Americans who participated in the in-depth interviews, online questionnaire, and screenings. Even though we did not try to recruit participants from different age groups and the qualitative aspect of the study consisted primarily of individuals between the ages of 21-25, by including the online questionnaire data we were able to include data from age groups from which we did not recruit from.

Qualitative and quantitative research methods both have their strengths and weaknesses. The qualitative aspect of this study helped us to capture the ambiguity of how participants responded to questions and increased our understanding of why Asian Americans do not have a clear understanding of hepatitis B. On the other hand, the quantitative aspects of this study gave us the opportunity to see look at actual numbers and percentages. This gave us concrete data that we were able to use to back up our research questions and to further back up our qualitative data. Both approaches helped us to explain the complexity of human behavior and thought processes but for future studies, a more formative approach can be used.

During the analysis phase of the qualitative data, our codebook and coding tree was peer-reviewed by four other researchers. This was done to ensure that all four peer-researchers agreed on the codes and sub-codes that were developed. This degree of agreement is called intercoder reliability. Intercoder reliability was important to achieve in this study because 1.) we wanted to make sure that there were no repetitive codes or themes, 2.) intercoder reliability assessed the quality of our codebook and coding tree and 3.) achieving intercoder reliability increased reliability of our qualitative research methods.

Three different sampling techniques were used in this study to mitigate bias. Using multiple sampling techniques allowed us to recruit from different populations of Asian Americans who came from different backgrounds and geographical locations. For example, snowball sampling was especially useful in recruiting participants who were not already acquainted with the main researcher. This allowed for broader perspectives on hepatitis B.

Recommendations

This study was able to contribute incrementally to the existing research on hepatitis B and Asian Americans. Since this was a preliminary study about hepatitis B, all of the data collected and presented in this study would benefit more extensive research. Upon concluding this study, further research should be done on how healthcare professionals, Asian American organizations, and community members can educate and facilitate conversations about hepatitis B with fellow Asian Americans. Inferring from the qualitative data collected from this study, hepatitis B resources, if made more readily available, would help create awareness about the disease and help possibly motivate Asian Americans to get vaccinated and screened for this condition. On a larger scale, by increasing the number of Asian Americans who are vaccinated and screened, incidence rates of hepatitis B can possibly decrease over time.

The lack of opportunities to learn about hepatitis B and cultural and linguistic factors look to be major determinants as to why many Asian Americans are unaware about hepatitis B and the effects on their health. Working with local, state, and international health organizations, and nonprofit organizations that cater to Asian American communities may be useful in developing accessible, translated, and culturally relevant hepatitis B resources that can capture the attention of Asian Americans, young and old. Generating interest and awareness about hepatitis B will need to be the first step in the process of assessing the hepatitis B needs in each diverse Asian community in the U.S. Conducting focus group discussions or in-depth interviews with community members, stake holders, and healthcare professionals may provide us with insight into what the overall perceptions of the disease is and the level of knowledge that already exist. From these focus groups and additional in-depth interviews, we can strengthen our preliminary findings and begin to address the hepatitis B disease burden in the Asian American community.

We can see from this study that there is a need to provide more accessible educational resources and materials to Asian Americans. By providing more resources like in-language brochures and photonovels, we can begin to close the knowledge gap and provide Asian Americans with the opportunity to learn more about health issues that disproportionately affect their community. After gathering and analyzing the data from this study, the main research question can be modified to focus more on identifying ways to better educate Asian Americans and how resources can be made more accessible. One major implication of this study is that the educational ideas suggested by the participants can serve as starting points for public health interventions and inform local and national health organizations about the best ways to provide information and generate awareness about hepatitis B. This study also has the potential to inform

larger qualitative studies that focus on the perceptions of hepatitis B, prevention strategies, or hepatitis B vaccination beliefs.

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Appendix A: Hepatitis B Serologic Marker Interpretation & Photonovel Example

Table 1. Hepatitis B Serologic Marker Interpretation

	HBsAg (Hepatitis B surface antigen)	Total anti-HBc (Antibody to hepatitis B core antigen)	IgM anti-HBc (immunoglobulin M to anti-HBc)	Anti-HBs (Antibody to HBsAg)	Interpretation
Test Results	-	-	-	-	Never infected and susceptible to infection
	+	+	-	-	Chronic infection
	-	+	+	-	Acute infection
	-	+	-	+	Immune by natural infection
	-	-	-	+	Immune by hepatitis B vaccination
	-	+	-	-	Immune by natural infection or possible false positive

Table 1. Interpretation of Hepatitis B Serologic Test Results. Adapted from the Center for Disease Control and Prevention. Division of Viral Hepatitis.

Figure 1. Example of a Vietnamese photonovel



Figure 1. Cultural Comic Book for Educating Asian Americans about Hepatitis B. Retrieved from PLOS Blogs by Viet Le. Public Health Perspectives.

Appendix B: In-depth Interview Participant Demographics

Table 2. Demographic information of in-depth interview participants

	Total (n=15)	Male (n=5)	Female (n=10)
Age			
18-25	10	2	8
25+	5	3	2
Place of Birth			
United States	11	5	6
Overseas	4	0	4
Ethnicity			
Vietnamese	3	2	1
Chinese	3	1	2
Korean	3	0	3
Lao	2	1	1
Tai Dam	2	0	2
Indian	1	0	1
Multiracial	1	1	0

Appendix C: Coded In-depth Interview Responses

Table 3: Example of participant responses to in-depth interview questions & related themes

Code/Subcode Analyzed	Participant Response	Related Theme
<p>3.1- General Hep. B Knowledge</p> <p>3.2 Asian Americans</p>	<p>“Honestly, I don’t really know much...I learned a little bit about it so it’s one of the three types of hepatitis. I think Hep. C is the one that...Hep. B is curable I think.” (3.1)</p> <p>“Well I know that there’s a bunch of different hepatitis so I get them confused but I don’t know much about it. I just know that it’s a liver disease and I know it can be deadly.” (3.1)</p> <p>“I’m not one hundred percent sure. I know it’s a viral illness? I’m not sure if that’s not right.” (3.1)</p> <p>“My knowledge on Hep. B is just...I’m aware that it is a disease that affects Asian Amer-well, Asians at a higher rate.” (3.2)</p> <p>“So earlier this year, I learned that hepatitis B affects your liver. Oh! It also affects Asian Americans.” (3.2)</p>	<p>Lack of confidence in Hep. B knowledge</p> <p>Awareness of Hep. B burden among Asian Americans</p>
<p>5.4- Alcohol consumption</p> <p>5.5- Unclean foods/sharing food</p>	<p>“Drinking, I would say. I guess I would-I assume that liver cancer and hepatitis B were caused by similar traits.” (5.4)</p> <p>"A lot, a lot of smoking and alcohol consumption. That’s about it.” (5.4)</p> <p>“I don’t know. It’s always-they always said it was alcohol. If you drink a lot of alcohol or</p>	<p>Risky Behaviors</p>

	<p>hard liquor, that's what we've always been told." (5.4)</p> <p>"I would say maybe eating unsafe food sources, unsafely sourced food." (5.5)</p> <p>"I think the biggest one I hear about is sharing drinks or like spoons." (5.5)</p>	
<p>6.1- Vaccination</p> <p>6.2- Vaccinated for HBV</p>	<p>"The only way I know is to get vaccinated." (6.1)</p> <p>"Making sure you get vaccinated or you're up-to-date on your vaccines. Making sure you've gotten the full dose." (6.1)</p> <p>"I've definitely had it [vaccine] cuz I know that I've had a hepatitis vaccine; just don't know what kind." (6.2)</p> <p>"I'm aware that I have been vaccinated when I was very young for hepatitis B." (6.2)</p> <p>"Pretty sure I'm vaccinated. I must've been a child. I must've been pretty young because I can't remember..." (6.2)</p>	<p>Hepatitis B prevention and vaccination</p>
<p>14.1-Mental Health</p> <p>14.3- Diabetes</p>	<p>"I know mental health is a big one because of the stigma." (14.1)</p> <p>"Probably another area would just be mental health in general. Asian Americans-well Asians in general do not really acknowledge mental health issues in a positive light." (14.1)</p>	<p>Asian American health issues of concern</p>

<p>14.4- High blood pressure/high cholesterol</p>	<p>“I want to say diabetes is—Asians are also predisposed to diabetes for some reason.” (14.3)</p> <p>“Hypertension, maybe also some things related to like eating or cholesterol...” (14.4)</p> <p>“I feel like high cholesterol. I’m just basing that off of you know, my parents.” (14.4)</p>	
<p>18.1 Language 18.2 Generational beliefs 18.3 Cultural beliefs 18.4 Aversion to seek care</p>	<p>“I mean probably one of the biggest things is the language barrier that stands.” (18.1)</p> <p>“It seems like younger generation is more progressive than some older generations and more open about speaking about different health issues.” (18.2)</p> <p>“They are stubborn especially the older people. I know that the men in their 40s, 50s, and 60s still don’t want to go to the doctor...” (18.2)</p> <p>“I can see how culturally any sickness, physical or mental can make you seem like a broken person and there’s this like stigma against sickness and like seeking help.” (18.3, 18.4)</p>	<p>Barriers to learning and seeking care in the Asian American community</p>
	<p>“I think because the Asian community is a community that works as kind of a group, especially the older portion, I think it’s important to-I guess provide information to them as a group.” (15.4)</p> <p>“It’s the family that has to be the one to talk about it and take care of each other.” (15.4)</p>	

<p>15.4 Collectivistic outreach</p> <p>15.5 Bridge generational gaps</p>	<p>“Try to get the whole group to be interested so that they can go tell their friends and family later.” (15.4)</p> <p>“I think it has a lot to do with educating the younger population like me and my sister so we can go home and be like, “mom, this is an issue.” (15.5)</p> <p>“I don’t know, I mean educating students I think is the best way to reach like people that are our parents’ age...if we’re trying to reach that population, I think it has a lot to do with educating the younger population” (15.5)</p>	<p>Generating hepatitis B awareness across generations</p>
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Appendix D: Hepatitis B Screening Results & Online Questionnaire Results

Table 4: Asian American hepatitis B screening results collected by CPACS (2017)

Status	Total (n=153)	Male (n=58)	Female (n=94)
Acute/Chronic Infection	9.80%	6.8%	11.70%
Immune due to HBV vaccine	24.0%	20.6%	13.8%
Immune due to natural infection	33.0%	31.0%	35.1%
Susceptible-vaccine eligible	26.7%	34.4%	22.3%
Interpretation unclear	3.9%	6.8%	2.1%
Additional follow-up needed	0.6%	0.0%	1.0%

Table 5: Results from the online hepatitis B questionnaire about hepatitis B transmission

Question	Total (n=39)	Male (18)	Female (21)
	Yes	No	Don't know
Can hepatitis B be spread by eating food prepared by an infected person?	19.4%	58.3%	22.2%
Can hepatitis B be spread from person to person by sharing razors?	83.3%	5.6%	11.1%
Can hepatitis B be spread through sexual intercourse?	97.2%	2.8%	0.0%
Can hepatitis B be spread from mother to child during childbirth?	80.6%	2.8%	16.7%
Do you think hepatitis B can cause liver damage?	72.2%	5.6%	22.2%
Do you feel comfortable talking to your doctor about hepatitis B?	94.4%	0.0%	5.6%
Do you feel comfortable talking to your family about hepatitis B?	61.1%	13.9%	25.0%

Appendix E: Qualitative In-Depth Interview Guide

Introduction:

Hello, my name is Caitlyn and I am a 2nd year graduate student at Emory's Rollins School of Public Health. I appreciate you taking the time to meet with me today and helping me with my research on hepatitis B. Before we begin, I want to give you a brief summary of my study. I am doing a qualitative study with in-depth interviews to explore the awareness, knowledge, and perception of hepatitis B among Asian Americans.

My study looks to examine the awareness of Asian Americans about hepatitis B and the factors that influence Asian Americans to engage in positive health behaviors like getting vaccinated or screened for hepatitis B. If at any time you feel uncomfortable, you are not obligated to answer any question and at any time you are allowed to opt out of the study. You can also go back to any questions during the interview if you have any new thoughts that you would like to express. This study is completely voluntary and you will not be compensated for your time. Finally, this interview will last approximately 30 minutes to an hour and I will be audio recording this interview.

Do you have any questions or concerns about the study or interview process?

Also, I would like to tell you that this audio-recorded interview will be deleted once I have transferred the file to my laptop and all identifying information will be removed to ensure your confidentiality and anonymity. Since I am the main investigator, I will be the only person who will be analyzing this interview. With that being said, would you be okay with being audio-recorded?

Warm-up Questions:

Before we get started, I would like to get to know you a little bit. So, I have a few simple questions that I would like to ask you.

1. What is your date of birth?
2. What is your ethnicity?
3. Were you born in the United States or overseas?
 - a. Probe: If you were born overseas, where were you born? (this will be asked only if participant is born outside of the U.S.)
 - b. Probe: When did you come to the United States? (this will be asked only if participant is born outside of the U.S.)
4. In what country were your parent(s) born?
5. How often do you drink alcohol?
 - a. Never
 - b. 2-4 times a month
 - c. 2-3 times a week

- d. 4 or more times a week
- 6. How many alcoholic drinks did you have on a typical day when you drank alcohol?
 - a. 1 drink
 - b. 2 drinks
 - c. 3-4 drinks
 - d. 5 or more drinks

Transition: Awesome! Thank you for sharing that with me. Now we will start to get into some questions about hepatitis B. (this is where I will begin to ask my key questions).

Key Questions:

1. Please tell me about your prior knowledge or perceptions of hepatitis B.
 - a. Probe: Where did you learn about this information?
 - b. Probe: How did you learn about this information?
 - c. Probe: When did you learn about hepatitis B?
2. What are some behaviors that you know of that can cause hepatitis B?
 - a. Probe: Tell me more about how you learned about the behaviors that you just talked about.
3. What are some ways that individuals can protect themselves from contracting hepatitis B?
 - a. Probe: Of the preventative measures that you described, which measure have you done personally?
 - i. If participant tells me about what they have done to protect themselves against Hep B., I will ask the following: why did you decide to do that?
4. So, to go along with the conversation about prevention, what is your opinion on vaccinations?
 - a. Probe: Why do you feel that way about vaccines?
 - b. Probe: Would you encourage those who have not been vaccinated to get vaccinated?
 - c. Probe: If yes, what would you tell those who are unvaccinated?
5. To keep on the same topic of vaccines, can you tell me what you know about the Hep B. vaccine?
 - a. Probe: If participant provides an answer, I will ask this: where did you learn about this vaccine?
 - b. Probe: Do you know if you have received the Hep. B vaccine?
 - c. Probe: If you remember when you were vaccinated, can you tell me when you were vaccinated?
6. Have you ever been tested for Hep? B?
 - a. Probe: If yes, what was the outcome?
 - b. Probe: If no, what are reasons as to why you haven't been tested?
7. If you were tested positive for Hep. B, would you seek treatment?
 - a. Probe: If yes, where would you go to seek treatment?
8. Thank you for sharing that with me. Now we are going to change up the conversation a little bit and begin to talk about some of the myths and perceptions of Hep. B.

9. Do you think a person with Hep. B experiences any kind of stigma or discrimination?
 - a. Probe: If yes, why do you think people think that way about people with Hep. B?
10. Can you tell me about some of the symptoms of Hep. B that you know of?
11. Thank you for sharing that with me. Now we are going to shift the conversation a little bit and begin to talk about the AAPI community as a whole.
12. Can you describe to me the health issues that you are aware of that exist in the Asian American community?
 - a. Probe: What do you think could be done to bring awareness to such health issue(s)?
13. How common do you think hepatitis B is in the Asian American community?
 - a. Probe: Interesting. Why do you think that is so?
14. Have you ever had a conversation about Hep. B with your friends or family or even doctor?
 - a. Probe: If yes, what kinds of things do you talk about in regards to Hep. B?
 - b. Probe: If not, would you be open to talking to your friends, family, or doctor about Hep B?
15. What kinds of barriers do you think exist in the AAPI community here in the [name of specific city, town, state, etc.] that may make it difficult for AAPIs to learn about hepatitis B?
 - a. Probe: How do you think these barriers affect their access to Hep B. services such as screenings and vaccines?
16. Can you tell me about the resources that you know about that provide information about Hep B?
 - a. Probe: If participant lists resources, I will ask: have you presented or informed your friends or family about the resources that you just listed?
17. What kinds of resources would you like to have to increase awareness about hepatitis B in the AAPI community?
 - a. Probe: How can those resources be best distributed to members of the AAPI community?

Cool Down Question(s):

18. We are coming down to the end of the interview but I would like to ask if you have anything else that you would like to share with me? Thoughts? Opinions? Stories?

