

Evaluation of a Hepatitis B Educational ESL Curriculum for Chinese Immigrants

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ABSTRACT

Objectives: According to recent census data, 1,216,600 Canadians are of Chinese descent, and over 80% of Chinese Canadians are foreign born. Approximately 10% of Chinese immigrants are chronic carriers of hepatitis B, compared with less than 0.5% of the general population. English as a second language (ESL) classes provide ready access for individuals with limited English proficiency who are not reached by English language health education materials and media campaigns. We conducted a group-randomized trial to evaluate the effectiveness of a hepatitis B ESL educational curriculum for Chinese immigrants.

Methods: Five community-based organizations that provide ESL education in the greater Vancouver area participated in the study. Forty-one ESL classes (which included 325 Chinese students) were randomly assigned to experimental or control status. A follow-up survey, conducted six months after randomization, assessed knowledge about hepatitis B. Generalized estimating equations were used to analyze the data.

Results: Follow-up surveys were completed by 298 (92%) of the students. At follow-up, experimental group students were significantly ($p < 0.05$) more likely than control group students to know that immigrants have higher hepatitis B infection rates than people who were born in Canada; hepatitis B can be spread during childbirth, during sexual intercourse and by sharing razors; hepatitis B is not spread by sharing eating utensils; and hepatitis B infection can cause cirrhosis and liver cancer.

Conclusion: Our findings indicate that ESL curricula can have a positive impact on health knowledge among Chinese immigrants with limited English. Future research should evaluate the effectiveness of ESL curricula for other immigrant groups, as well as other health topics.

Key words: Chinese; health education; hepatitis B

La traduction du résumé se trouve à la fin de l'article.

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Over the last three decades, North America has experienced one of the largest immigration waves in history.¹ According to census data, the Chinese Canadian population increased from 1,029,400 in 2001 to 1,216,600 in 2006.² Nearly one in five residents of the Vancouver Metropolitan Area and one in 10 residents of the Toronto Metropolitan Area are of Chinese descent.³ Over 80% of Chinese Canadians are foreign born, and nearly 20% can only speak a Chinese language/dialect.²

Worldwide, over 80% of liver cancers are attributable to chronic hepatitis infection.⁴ Hepatitis B virus (HBV) infection is endemic in most Asian countries.⁵⁻⁷ Therefore, it is not surprising that the rate of chronic HBV infection among Chinese immigrants to North America is over 10 times the general population rate of less than 0.5%.⁸ In Asian countries, HBV transmission usually occurs vertically from mother to child at birth. However, horizontal transmission can also occur through sexual intercourse or close household contact (e.g., by sharing razors) with a carrier.⁵ Potential strategies for controlling hepatitis B include the routine testing of immigrants, vaccinating immigrants who have never been exposed to the virus and educating immigrant communities about transmission routes.⁹

English as a second language (ESL) classes provide ready access for individuals with limited English proficiency who are not generally reached by English health education materials and media campaigns.¹⁰ Bennett and colleagues¹¹ recently published a review of programs that combine cancer control education and ESL instruction. A search of multiple databases yielded 11 ESL programs

that included cancer control information in their curricula. However, no controlled studies describing the effectiveness of ESL curricula were identified. Further, we were unable to find any studies that evaluated health education ESL curricula for Asian populations. The Canadian English Language Services for Adults (ELSA) program offers ESL classes for immigrants.¹² We collaborated with community organizations that provide ELSA classes to evaluate an ESL curriculum that was designed to improve levels of knowledge about hepatitis B among Chinese immigrants.

METHODS

Research setting

Our research was conducted in the lower mainland of British Columbia (BC). During 2006, 168,000 residents of Vancouver city

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(29% of the population) were of Chinese descent. Additionally, several other cities in the BC lower mainland had sizeable Chinese communities; for example, Richmond had 76,000 Chinese residents (44% of the population).¹³ Five BC community organizations that provide ELSA education to Chinese immigrants participated in the study. The BC ELSA program offers level 1 (low beginner) through level 5 (high intermediate) ESL classes. Each student progresses through the ELSA levels as his/her English proficiency improves.¹² Our hepatitis B ESL curriculum was delivered to ELSA level 3 (low-intermediate) classes. We elected to target low-intermediate students because representatives from our collaborating community organizations advised us that this was the most appropriate level for a HBV curriculum.

Study overview

We conducted a group-randomized controlled trial. Specifically, 41 ELSA level 3 classes (which included 325 students) were randomly assigned to experimental or control status during 2006 and 2007. A blocked randomization scheme was used whereby classes from each of the five participating community organizations formed a stratum and were randomized within the stratum. The students in the experimental group received a three-hour ESL curriculum addressing hepatitis B, and students in the control group received a three-hour ESL curriculum addressing physical activity. Certified ESL teachers with experience in teaching ELSA level 3 classes were hired and trained (in either the hepatitis B or physical activity curriculum). Different teachers delivered education to the experimental and control group classes. Each student was asked to complete a follow-up survey six months after attending his/her project class.

Study participants were aged 18 or older and of Chinese descent. All Chinese students were included, regardless of their country of origin (e.g., China or Taiwan) and native language/dialect (Cantonese or Mandarin). There are two forms of written Chinese (simplified and traditional).¹⁴ Therefore, study materials that were read by study participants were translated into simplified and traditional Chinese script. Similarly, study materials that were read to participants were translated into Cantonese and Mandarin. All project staff members with direct participant contact were trilingual (Cantonese, Mandarin and English). The BC Cancer Agency Institutional Review Board approved our study procedures.

Hepatitis B ESL curriculum

Our hepatitis B ESL curriculum has been described in detail elsewhere.¹⁵ We aimed to develop a curriculum that would improve hepatitis-B-related knowledge. It included information about the high rate of HBV infection in Chinese Canadian communities, the ways in which HBV can be transmitted from person to person and the potential consequences of HBV infection. Our hepatitis B ESL curriculum incorporated standard ESL teaching methods and included multiple commonly used types of ESL lesson exercises.^{12,16} As an example, students completed an information gap exercise. This exercise involved working in pairs to fill in worksheets. One student in the pair received worksheet A and the other received worksheet B. Student A was missing some vocabulary from his/her story, and student B was missing other vocabulary. The students worked together taking turns reading, speaking, listening and writing. Once students had finished filling in their stories, they worked on answering comprehension questions on the back of their work-

sheet. At the end of their ESL class, students received a pamphlet (with Chinese and English text) that reinforced key learning points.

Baseline procedures

Project staff collaborated with the regular teacher and project teacher for each class to schedule recruitment and associated project classes. Project classes were generally scheduled within one week of recruitment classes. At each recruitment class, the regular teacher explained that the study would see whether health education in English classes could improve immigrants' health; a guest speaker would shortly be coming to the class to provide instruction about a health topic; and only Chinese students were being invited to be part of the study, but all students could attend the health education class. Project staff then distributed Chinese language recruitment flyers (which provided detailed information about the project) and answered questions. Students who agreed to participate provided written consent and completed a brief baseline data collection form (in simplified or traditional Chinese). Specifically, students provided their name, address, telephone number and e-mail address (if applicable), as well as contact information for two people who would know how to reach them if they moved.

Follow-up procedures

Trial participants were asked to complete a follow-up survey six months after their project class. All students received a letter reminding them that they had agreed to participate in the study. About two weeks later, an interviewer contacted the student and arranged an in-person interview. Up to 11 telephone contacts were attempted (including at least 3 daytime, 3 evening and 3 weekend attempts). If participants were not contactable by telephone and an e-mail address was available, up to 3 e-mail contacts were attempted. Follow-up survey participants were offered \$20 as a token of appreciation for their time. The follow-up survey instrument included questions involving hepatitis B and physical activity knowledge, as well as demographic questions.

The follow-up survey was administered in Cantonese or Mandarin and asked students whether they thought immigrants were more likely to be infected with hepatitis B than people who were born in Canada; whether hepatitis B could be spread during childbirth, during sexual intercourse and by sharing razors; and whether hepatitis B infection could cause liver cancer, cirrhosis and lifelong infection. We also queried participants about routes of transmission that are not applicable to HBV infection. Specifically, we asked whether they thought hepatitis B could be spread by eating food prepared by an infected person, sharing eating utensils and coughing.

Data analysis

We used chi-square tests to compare the demographic characteristics of students who were randomly assigned to the experimental and control arms. Our evaluation of intervention effectiveness was based on responses to HBV knowledge items that were included on the follow-up questionnaire. Specifically, we compared the responses of experimental and control group students. Because our randomization was by group rather than by individual, generalized estimating equations were used for our evaluation.¹⁷ These multivariable analyses adjusted for the following variables: ESL organization, class time (day versus evening), country of origin (China versus other), native language (Cantonese versus Mandarin), years

Table 1. Study Group Characteristics

Characteristic	Experimental Group Students (n=141) n (%)	Control Group Students (n=157) n (%)	p Value	All Students (n=298) n (%)
Country of origin				
China	118 (84)	137 (87)	0.48	255 (86)
Other	23 (16)	20 (13)		43 (14)
Native language				
Cantonese	12 (9)	30 (19)	0.01	42 (14)
Mandarin	129 (91)	127 (81)		256 (86)
Years since immigration				
<2	68 (48)	68 (43)	0.46	136 (46)
≥2	73 (52)	89 (57)		162 (54)
Sex				
Male	37 (26)	51 (32)	0.29	88 (30)
Female	104 (74)	106 (68)		210 (70)
Age group, in years				
<40	61 (44)	84 (54)	0.11	145 (49)
≥40	79 (56)	73 (46)		152 (51)
Years of education				
<16	85 (60)	94 (60)	0.99	179 (60)
≥16	56 (40)	63 (40)		119 (40)
Marital status				
Currently married	127 (90)	136 (87)	0.46	263 (88)
Not currently married	14 (10)	21 (13)		35 (12)

Table 2. Hepatitis B Knowledge

Knowledge Variable	Experimental Group Students (n=141) %	Control Group Students (n=157) %	Adjusted OR* (95% CI)	Adjusted p value*
Immigrants are more likely to be infected with HBV than people who were born in Canada	37	24	2.0 (1.2-3.5)	0.01
HBV can be spread during childbirth	87	78	1.8 (0.9-3.4)	0.09
HBV can be spread during sexual intercourse	77	62	2.1 (1.2-3.6)	0.007
HBV can be spread by sharing razors	97	78	9.4 (3.1-28.6)	<0.001
HBV is not spread by eating food that was prepared by an infected person	75	68	1.3 (0.8-2.3)	0.34
HBV is not spread by sharing eating utensils	37	13	4.4 (2.4-8.2)	<0.001
HBV is not spread by coughing	61	46	1.5 (0.9-2.4)	0.13
HBV infection can cause cirrhosis	94	83	2.9 (1.2-7.0)	0.01
HBV infection can cause liver cancer	94	82	3.1 (1.3-7.1)	0.008
HBV can cause lifelong infection	51	50	0.7 (0.4-1.2)	0.24

* Adjusted for ESL organization, class time, country of origin, native language, years since immigration, sex, age group, years of education and marital status. OR=odds ratio; CI=confidence interval.

since immigration (<2 versus ≥2), sex, age in years (<40 versus ≥40), years of education (<16 versus ≥16) and marital status (currently married versus not currently married).

RESULTS

Follow-up survey response

Over 90% of the students completed a follow-up survey (91% of the experimental group and 92% of the control group). Follow-up data were available for 298 students (141 experimental group students and 157 control group students). The other 27 students either refused to complete a follow-up survey or could not be contacted after multiple attempts (the number specified in the study protocol).

Study group characteristics

Our study group comprised 88 men and 210 women. Table 1 provides information about the characteristics of our participants with follow-up data. The experimental and control groups did not differ with respect to country of origin, years since immigration, sex, age group, years of education or marital status. However, the control group students were significantly more likely to report that their native language was Cantonese than the experimental group students.

Hepatitis B knowledge

The odds ratios (OR) and 95% confidence intervals (CI) from our generalized estimating equations are given in Table 2. (Each OR

estimates the relative likelihood that students from the experimental group knew the correct answer to a knowledge question, as compared with students from the control group. An OR of greater than 1.00 indicates that the experimental group students were more likely to know the correct answer than control group students.) Our experimental group students had higher levels of knowledge than our control group students for all but 1 of the 10 knowledge variables that were examined in this study. Differences between students in the experimental and control arms were statistically significant ($p < 0.05$) for the following knowledge variables: immigrants are more likely to be infected with HBV than people who were born in Canada, HBV can be spread during sexual intercourse, HBV can be spread by sharing razors, HBV is not spread by sharing eating utensils, HBV infection can cause cirrhosis, and HBV infection can cause liver cancer.

DISCUSSION

Our findings indicate that an ESL curriculum for Chinese immigrants can have a positive impact on hepatitis-B-related knowledge. We were only able to identify one study that included a formal outcome evaluation of health education delivered during adult ESL classes. Elder and colleagues evaluated a nutrition educational program for Hispanic ESL students in San Diego, California.¹⁰ Nutritional change materials were incorporated into the English language curriculum. Participants were exposed to either nutrition education or stress management classes designed specifically for

adults with limited English. Self-report surveys were administered to collect students' nutrition-related knowledge and fat avoidance behaviours. Data were collected at baseline, three months and six months. Results indicated long-term intervention effects on both nutrition knowledge and fat avoidance.

This study's strengths include our group-randomized study design and low loss to follow-up (less than 10%) among the students. However, the study also has several limitations. We focused on one ethnic immigrant group, and our participants had a relatively high educational level (40% reported at least 16 years of education). Our findings may not be applicable to other racial/ethnic immigrant groups or Chinese immigrant populations with lower educational levels. Representatives from our collaborating community organizations did not think it would be feasible to administer a baseline survey within the context of ELSA classes and, therefore, we did not collect baseline hepatitis B knowledge data. While it is unlikely because of the randomization, there is a small possibility that the experimental group had higher levels of knowledge about hepatitis B at baseline.

Rudd and colleagues summarized the medical and public health literature addressing health and literacy.¹⁸ They noted that one important area for strategic development in health education is the design and evaluation of ESL teaching modules. Further, a 2004 Institute of Medicine report on health literacy noted that adult basic education organizations have limited resources for health curricula development and recommended cooperative efforts between health and education systems to develop and evaluate curricula that serve the needs of both health education and English language instruction.¹⁹ Future research projects should evaluate ESL curricula that address other health topics, as well as the efficacy of health education ESL curricula for other immigrant populations.

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RÉSUMÉ

Objectif : Selon les données du dernier Recensement, 1 216 600 Canadiens sont d'ascendance chinoise, et plus de 80 % des Sino-Canadiens sont nés à l'étranger. Environ 10 % des immigrants chinois sont porteurs chroniques de l'hépatite B, contre moins de 0,5 % dans la population générale. Les classes d'anglais, langue seconde (ALS) permettraient de joindre facilement les personnes qui maîtrisent mal l'anglais et que l'on n'atteint pas par les outils d'éducation sanitaire et les campagnes de publicité-médias en anglais. Nous avons mené un essai de groupe randomisé pour évaluer l'efficacité d'un programme d'ALS pour les immigrants chinois qui comportait un cours sur l'hépatite B.

Méthode : Cinq organismes communautaires qui enseignent l'ALS dans la région du Grand Vancouver ont participé à l'étude. Nous avons attribué au hasard à 41 classes d'ALS (incluant 325 étudiants chinois) le statut de groupe expérimental ou témoin. Un questionnaire de suivi administré six mois après l'étude randomisée a permis d'évaluer les connaissances des étudiants sur l'hépatite B. Les données ont été analysées à l'aide d'équations d'estimation généralisées.

Résultats : Le questionnaire de suivi a été rempli par 298 étudiants (92 %). Lors du suivi, les étudiants du groupe expérimental étaient significativement ($p < 0,05$) plus susceptibles que les étudiants du groupe témoin de savoir que les immigrants ont des taux d'infection par l'hépatite B supérieurs à ceux des personnes nées au Canada; que l'hépatite B peut se transmettre durant l'accouchement, durant les rapports sexuels et lorsqu'on partage un rasoir; que l'hépatite B ne se transmet pas par le partage d'ustensiles; et que l'infection par l'hépatite B peut causer la cirrhose et le cancer du foie.

Conclusion : Les programmes d'ALS peuvent avoir un impact positif sur les connaissances sanitaires des immigrants chinois qui maîtrisent mal l'anglais. Les études futures devraient évaluer l'efficacité des programmes d'ALS auprès d'autres groupes d'immigrants et pour d'autres thématiques de santé.

Mots clés : Chinois; éducation sanitaire; hépatite B