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Original Article

Health Literacy Disparities about Hepatitis B: A National Assessment in Iran

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Abstract

Background and Aims: Worldwide, about 350 million people are infected with Hepatitis B virus (HBV), most of them in Asia. Up to 1 million of them die due to these sequels annually. Few studies have expressed concern about HBV awareness of Iranians young people. As health education programs should be based on awareness of target group about the disease, we conducted a national survey to evaluate health literacy and vaccination status of Iranians young people regarding HBV. The purpose of our study was to find Iranian adolescents' health literacy deficit hepatitis B (HBV) and associated factors.

Materials and Methods: We conducted a questionnaire-based national survey of 18-year-old adolescents according to stratified cluster random sampling in Iran during 2007.

Results: Assuming 75% as the appropriate awareness, only 21.3% of adolescents had good literacy about hepatitis B. Lower levels of education, living in urban areas, celibacy and male gender were associated with lower health literacy. The health literacy of HBV infected people about major routes of HBV transmission was low ($P < 0.001$).

Conclusion: There are important deficits in adolescents' health literacy about HBV. We should focus on implementing educational campaigns about HBV through media for the Iranian community.

Keywords: Health literacy, Hepatitis B

Introduction

Worldwide, about 350 million people are infected with Hepatitis B virus (HBV), most of them in Asia (1, 2). 15 to 40% of HBV infected people develop ominous sequels such as chronic active hepatitis, cirrhosis and liver cancer (1). Up to 1 million of them die due to these sequels annually (3). It is estimated that over 35% of Iranians have been exposed to HBV (3). Liver cancer, which is the 3rd cause of cancer death in the world (4), is etiologically related to HBV in 80% of cases.(٥)

Worldwide the countries are defined as high, intermediate and low prevalence areas according to the HBV carrier state of ≥8, 2%-7% and <2%, respectively (1). Iran has probably moved from intermediate to low prevalence areas (6), as by implementation of the National HBV Vaccination Plan, now almost all 20 year old and younger Iranian people are vaccinated against HBV. By this program and routine screening of all pregnant women for HBV, the previous ways of HBV transmission in Iran, namely vertical and

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childhood transmission (7), have become less important whereas horizontal ways such as sexual contact and intravenous drug use (IDU) have become more prominent (7-10).

Studies have shown that having appropriate knowledge, attitude and practice could decrease transmission of many infectious diseases (11, 12) including HBV (13, 14) in susceptible people.

Most studies about HBV knowledge assessments of Asians have been done in North America among Cambodian (5), Vietnamese (15, 16), Korean (17) and Chinese (18) minorities, and this knowledge was mostly low. However, studies in Singaporean people showed different situation (2, 19). To our knowledge, there are no exact statistics of hepatocellular carcinoma (HCC) prevalence in Iran, through the studies on Asians living in the USA have shown that the prevalence of HCC among Chinese and Cambodian immigrants, and generally in Asian American people is high compared with the US population (13, 17, 20); also, the California Cancer Registry (CCR) data reveals that Southeast Asian population have higher rates of liver cancer than other racial/ethnic communities (21, 22). HCC is the sixth common cancer and the third main cause of death due to cancer in the world (23).

Few studies concerned about the HBV awareness of Iranian young people. As health education programs should be based on the awareness of target group about the disease, we conducted a national survey to evaluate the health literacy and the vaccination status of Iranian young people regarding HBV.

Methods

Setting

The data of this article were collected during a national campaign for HBV vaccination of all 18-year-old Iranian adolescents in February 2007 according to a multistage sampling technique.

In Iran, health and medical services are divided among 41 medical universities, and each university in its territory has a rural health-medical center for each village and several urban health-medical centers for cities based on their population .

Our sampling method was stratified cluster random sampling; in the territory of each medical university, five rural and five urban health-medical centers were selected; and the total of 16,075 questionnaires were distributed among these centers proportional to their population size that was registered in the Health Ministry statistics.

The survey was administered by Center of Disease Control and Prevention personnel of each university in the rural and urban health-medical centers throughout Iran. The project was approved by the Research Ethics Board of the Tehran University of Medical Sciences (Tehran, Iran).

After being vaccinated, a brief description about the survey was given to the respondents. Next they were invited for the study and their oral inform consent was taken. It was self-administered and anonymous.

Survey instrument

The questionnaire was presented in Persian language and contained demographic, health literacy, previous testing for HBV, any previous HBV vaccination, and if answer was not, its reason(s). Any source of hearing about HBV was also questioned. Demographic section included the place of residence, gender, marital status, education, school type, and father's, mother's and if had, spouse's education.

The first health literacy question was about organ(s) infected in hepatitis, and the rest included three questions concerning the outcome of HBV, and 14 questions about the methods of transmission (Table 1) (24).

For refining the questionnaire, it was read by five adolescents of similar age to ensure understanding of all items; then it was completed by 15 adolescents two times with one week interval for assessing the test-retest reliability ($r>0.6$). Finally, it was piloted in a high school classroom with 34 students for final revision and calculation of the sample size. We questioned sensitive topics with non-offensive sentences .

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Statistics

There were three answers for the health literacy items: "Yes", "No" and "Don't know". A correct answer scored 2 points; "Don't know" answer 1 point, and incorrect answer scored 0 point (possible score 0-36).

The respondents who took 75% of knowledge score (27 scores) arbitrarily said having good knowledge (25).

Proportions of the respondents with good health literacy were evaluated. Bivariate associations between the independent variables and the participants with good health literacy were examined using complex sample analysis in SPSS 15. P-values <0.05 were considered significant.

Results

Overall, 13964 questionnaires were filled out (response rate = 87%). Table 2 shows the baseline characteristics of the studied population. Fifty seven percent of the respondents held diploma, or were in the precollege course. On the other hand, only 7.8% of fathers and 3.1% of mothers were college-educated and 49.9% of fathers and 61.9% of mothers had primary education or less.

The average HBV knowledge score in Iran is 23.4 out of the total of 36; with people at Lorestan province having the highest (25.9) and Qom province having the lowest score (22).

Assuming 75% as the appropriate awareness, only 21.3% of the studied adolescents had good knowledge about HBV, with the Lorestan province having the highest (37.9%) and Zabol adolescents having the lowest score (9.7%). 7.3% of young people said they had been tested for HBV, and 6.5% of them were aware of their positive results. Only 7.5% of the adolescents aware of being infected had appropriate knowledge about HBV (P<0.001).

Table 2 shows that females (married or single) achieved a higher percentage on having appropriate literacy about HBV (P<0.001) than their male counterparts; this also holds for the girls in rural areas (P<0.001). Also a higher percentage of those who were married (P<0.001) and those in the villages had good knowledge of Hepatitis B (P<0.001) .

Type of school was associated with the level of HBV knowledge (P=0.016); those studied in the National Organization for Development of Exceptional Talents achieved higher percentage of appropriate knowledge; however, there were no significant differences between the public and private schools.

Parents level of education had a key role in the awareness level of young people (P<0.001). Greater percentage of young people, either those whose parents had academic education or diploma, had appropriate knowledge but there were no significant difference between the middle-school and elementary school graduates' levels of HBV knowledge. A high percentage of married youth had appropriate HBV knowledge (P<0.001), and this had a direct relationship with the spouse's education level (P=0.007).

The rate of correct answers to the questions is shown in Table 1 (24). In the part of seriousness of the disease, the lowest level of knowledge was about the hepatitis B risk of cancer (38.1% correct answer). In transmission part, the most correct answer was transmission through injecting drugs and with blood (the correct answer was 72.8 and 70.1%, respectively) and the lowest level of awareness was about transmission by domestic contacts (29.2%).

Approximately eighty percent of the young people had never received any Hepatitis B vaccine.

Table 3 shows that the majority of the non-vaccinated respondents said that the main reason of not vaccination is lack of knowing about the importance of vaccination for Hepatitis B (55.4%). On the other hand, 62.3% of the participants mentioned that they have heard about the transmission and prevention of hepatitis B. They also mentioned that the most important sources of knowing about this concept are radio and TV (81.6%). Ways of knowing are listed in Table 4.

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Table 1: Hepatitis B knowledge questions.

	Correct answer	**Percent**
Which organ is infected by Hepatitis B?[1]	**Liver**	**60.3**
Which statement is correct about Hepatitis B?		
Hepatitis B can be severe and fatal.[2]	**Yes**	**57**
Hepatitis B can cause liver cancer. [2]	**Yes**	**38.1**
Hepatitis B can persist in body lifelong. [2]	**Yes**	**39.7**
Who is at risk of Hepatitis B?		
Medical personnel[2]	**Yes**	**43.3**
Prisoners[2]	**Yes**	**59.9**
Those who eat opium[3]	**No**	**24.2**
Those who inhale opium [3]	**No**	**28.4**
Those who inject drugs [2]	**Yes**	**72.8**
Those who have had contact with the blood of a person with Hepatitis B[2]	**Yes**	**70.1**
Those who have had contact with the body secretions of a person with Hepatitis B such as saliva[2]	**Yes**	**47.6**
Spouse of a person with Hepatitis B[2]	**Yes**	**59.1**
Those who have had a person with Hepatitis B in home (except for spouse) [2]	**Yes**	**29.2**
Those who have had body piercing e.g. tattooing[2]	**Yes**	**55.3**
Those who have had hand shaking with a person with Hepatitis B[3]	**No**	**42**
Those who have breathed in room where a person with Hepatitis B coughed or sneezed [3]	**No**	**40.6**
Those who have shared personal belongings with a person with Hepatitis B, e.g. razor (without a cut)[2]	**Yes**	**55.2**
Multi-partner persons[2]	**Yes**	**66**

1. Liver versus eye, skin, other organs
2. Yes versus No or Don't know
3. No versus Yes or Don't know

Discussion

With implementation of the policy of the National Neonatal HBV Vaccination in Iran, HBV prevalence has been decreased. Therefore, we suppose to see significant changes in the contribution parts of the different modes of infection transmission in the future. Adolescents have more open social contacts, and they might be more exposed to HBV transmission. Based on the results of this study, merely one-fifth of the adolescents have acceptable knowledge about Hepatitis B, which is not convincing; Furthermore, level of awareness and knowledge regarding HBV is very low in Zabol city, which has a high prevalence of the HBV infection in Iran (Figure 1).

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Table 2: Characteristics of the study group (n = 13964) and their relations to health literacy (Bivariateanalysis).

Independent variables	Frequency of states (%)	Percent of good health literacy in each states	P value
Gender:			
Male	42.5	18	<0.001
Female	57.5	23.7	
Residence:			
Urban	64.4	20.2	<0.001
Rural	35.6	23.6	
School type:			
Public	86.2	20.8	0.016
Private	8.8	20.9	
Semiprivate	4	16	
Special	1	28.4	
Marital status:			
Married	8.7	27.1	<0.001
Single	91.3	20.7	
Education:			
Precollege	1.5	30.9	<0.001
High school diploma	56.2	22.1	
Middle school	37	20.5	
Elementary school & lower	5.3	17.7	
Mother education:			
College	3.1	25.3	<0.001
High school diploma	16.5	25.4	
Middle school	18.6	20.9	
Elementary school & lower	61.9	19.9	
Father education:			
College	7.8	27	<0.001
High school diploma	22.4	22.7	
Middle school	20.5	19.7	
Elementary school & lower	49.4	20.1	
Spouse education:			
. College	11	38.3	0.007

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High school diploma	39.5	26.1	
Middle school	31.3	24.7	
Elementary school & lower	18.2	22.2	
Tested for Hepatitis B	7.3	20.7	<0.001
Positive for Hepatitis B	6.5	7.5	<0.001

Table 3: Response of young people to question "Why they did not vaccinate regarding Hepatitis B?"

Vaccine is not available.	39.4
It is expensive.	42.9
I do not know it is necessary.	55.4
Vaccine may have side effects.	28.6
I'm not confident about it.	17.1
It may have infectious agents.	16.7
Vaccine injection is painful.	30.9
I did not have time for it.	41.8

Table 4: Source of taking information about Hepatitis B by young people

Newspapers or magazines	47.5
Radio or TV	81.6
Computer or Internet	24.2
School or teachers	65.8
Friends	57
Family members or relatives	64.6

Hence, implementing and developing the educational programs can contribute to the public awareness and knowledge regarding HBV especially in highly prevalent areas.

Furthermore, we found that the level of knowledge is associated with the subjects' education level and type of school. Indeed, this finding implies to design effective ways to train students about HBV in lower educational levels, especially in public middle schools, which have lower health literacy about HBV. In addition, catch up vaccination for adolescents in high school, as well as education and promotion of safe practice are worthy strategies for reducing HBV infection. Subjects of the present study are good samples of high-risk adolescents for a survey on the educational programs. Countrywide sampling makes the results more reliable for the national policy and decision makers.

Considering that uneven questionnaires have been used in the previous similar studies, we inevitably compared our study with several other researches conducted around the world; in North America, several studies have evaluated the knowledge about Hepatitis B among Asian minorities such as Asian Americans in Baltimore–Washington Metropolitan Area (28). Vietnamese and Cambodians in Seattle (29, 30), Vietnamese students in Massachusetts, and Chinese immigrants in Canada (13).

Regarding the HBV vaccination history among the respondents, about 80% of them reported that they had never received any Hepatitis B vaccine due to the lack of knowledge about the importance of vaccination. This emphasizes

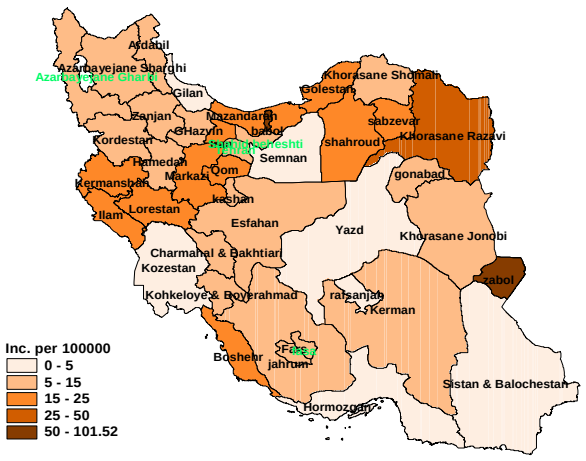

Fig. 1. Frequency of HBV Reported by Iranian medical universities (I.R.IRAN-2006).

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the necessity of learning more about Hepatitis B.

Although Hepatocellular carcinoma is common among Asian people (13, 20, 28), our data revealed an important knowledge deficit about the cancer risk of HBV among Iranian people.

According to the participant's views, radio and TV as the most important tools for their awareness about HBV; therefore, implementing educational campaigns with emphasis on the HBV risk of HCC through these media is necessary for the Iranian community. In this context, recent Vietnamese Health Promotion Program demonstrated the significant positive impact of media on increasing the knowledge about transmission of Hepatitis B (1). However, the study by Dae Won Jun et al. among Korean adults determined that despite the wide spread media information, awareness about chronic liver disease in Korean adults is lower than expected (30). Future research should improve Hepatitis B and liver cancer prevention and control programs for Iranian population.

Conclusions

There are important deficits in adolescents' health literacy about HBV. We should focus on implementing educational campaigns about HBV through media tools for Iranian community.

References

1. Lok AS, McMahon BJ. Chronic hepatitis B: update 2009. Hepatology. 2009;50(3):661-2.
2. Lu W, Mak B, Lim S, Aung MO, Wong M, Wai C. Public misperceptions about transmission of hepatitis B virus in Singapore. Annals Academy of Medicine Singapore. 2007;36(10):797.
3. Sali S, Bashtar R, Alavian SM. Risk factors in chronic hepatitis B infection: a case-control study. Hepat Mon. 2005;5(4):109.
4. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. CA: A Cancer Journal for Clinicians. 2005;55(2):74-108.
5. Taylor VM, Jackson JC, Chan N, Kuniyuki A, Yasui Y. Hepatitis B knowledge and practices among Cambodian American women in Seattle, Washington. Journal of Community Health. 2002;27(3):151-63.
6. Javadi A, Avijgan M, Hafizi M. Prevalence of HBV and HCV infections and associated risk factors in addict prisoners. Iranian Journal of Public Health. 2006;35(4):33-6.
7. Zali MR, Mohammad K, Farhadi A, Masjedi MR, Zargar A. Epidemiology of hepatitis B in the Islamic Republic of Iran. Eastern Mediterranean health journal. 1996;2(2):290-8.
8. Alter MJ, Hadler SC, Margolis HS, Alexander WJ, Hu PY, Judson FN, et al. The changing epidemiology of hepatitis B in the United States: need for alternative vaccination strategies. JAMA. 1990;263(9):1218-22.
9. Stevens CE, Beasley RP, Tsui J, Lee W-C. Vertical transmission of hepatitis B antigen in Taiwan. New England Journal of Medicine. 1975;292(15):771-4.
10. Coursaget P, Yvonnet B, Chotard J, Vincelot P, Sarr M, Diouf C, et al. Age-and sex-related study of hepatitis B virus chronic carrier state in infants from an endemic area (Senegal). Journal of medical virology. 1987;22(1):1-5.
11. Hamer DH, Connor BA. Travel health knowledge, attitudes and practices among United States travelers. Journal of travel medicine. 2004;11(1):23-6.
12. Herck K, Zuckerman J, Castelli F, Damme P, Walker E, Steffen R. Travelers' knowledge, attitudes, and practices on prevention of infectious diseases: results from a pilot study. Journal of travel medicine. 2003;10(2):75-8.
13. Samoff E, Dunn A, VanDevanter N, Blank S, Weisfuse IB. Predictors of acceptance of hepatitis B vaccination in an urban sexually transmitted diseases clinic. Sexually transmitted diseases. 2004;31(7):415-20.
14. Rhodes SD, DiClemente RJ, Yee LJ, Hergenrather KC. Correlates of hepatitis B vaccination in a high-risk population: an Internet sample. The American journal of medicine. 2001;110(8):628-32.
15. Taylor VM, Choe JH, Yasui Y, Li L, Burke N, Jackson JC. Hepatitis B awareness, testing, and knowledge among Vietnamese American men and women. Journal of community health. 2005;30(6):477-90.
16. Wiecha JM. Differences in knowledge of hepatitis B among Vietnamese, African-American, Hispanic, and white adolescents in Worcester, Massachusetts. Pediatrics. 1999;104(Supplement 6):1212-6.
17. Choe JH, Chan N, Do HH, Woodall E, Lim E, Taylor VM. Hepatitis B and liver cancer beliefs

[Downloaded from journal.isv.org.ir on 2026-11-10]

[DOI: 10.21859/isv.8.2.3.18]

among Korean immigrants in Western Washington. Cancer. 2005;104(S12):2955-8.
18.Hislop TG, Teh C, Low A, Li L, Tu S-P, Yasui Y, et al. Hepatitis B knowledge, testing and vaccination levels in Chinese immigrants to British Columbia, Canada. Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique. 2007:125-9.
19.Wai C-T, Mak B, Chua W, Tan M-H, Ng S, Cheok A, et al. Misperceptions among patients with chronic hepatitis B in Singapore. World journal of Gastroenterology. 2005;11(32):5002.
20.Taylor VM, Tu S-P, Woodall E, Acorda E, Chen H, Choe J, et al. Hepatitis B knowledge and practices among Chinese immigrants to the United States. Asian Pacific Journal of Cancer Prevention. 2006;7(2):313.
21.London WTaM, K.A. Liver cancer. in: D. Schottenfeld, J.F. Fraumeni (Eds.) Cancer Epidemiology and Prevention. Oxford University Press, New York. 1996:772–793.
22.Perkins CM, CR.; Wright, WE.; Young, JL. Cancer Incidence and Mortality in California by Detailed Race/Ethnicity, 1988–1992. Sacramento: California Department of Health Services; 1995.
23.Herszenyi L, Tulassay Z. Epidemiology of gastrointestinal and liver tumors. European review for medical and pharmacological sciences. 2010 Apr;14(4):249-58. PubMed PMID: 20496531. Epub 2010/05/26. eng.
24.Roushan N, Nasiri Toosi M, Meysamie A, Esteghamati AR, Hajrassuliha H. Hepatitis B knowledge among Iranian adolescents: a national survey. Iranian Red Crescent medical journal. 2013 Dec;15(12):e11558. PubMed PMID: 24693383. Pubmed Central PMCID: PMC3955498. Epub 2014/04/03. eng.
25.Felianka Kaftandjieva. Methods for setting cut scores in criterion-referenced achievement tests: A comparative analysis of six recent methods with an application to tests of reading in EFL. http://www.ealta.eu.org/documents/resources/FK_second_doctorate.pdf
26.Liu X. Classification accuracy and cut point selection. Statistics in medicine. 2012 Oct 15;31(23):2676-86. PubMed PMID: 22307964. Epub 2012/02/07. eng.
27.USAID. Assessment of knowledge and attitude of married women on maternal and new bornin selected Union Concils of Project districts. http://www.popcouncil.org/pdfs/Pakistan/PAIMAN_AssessKAReport.pdf.
28.Juon H-S, Lee S, Strong C, Rimal R, Kirk GD, Bowie J. Peer Reviewed: Effect of a Liver Cancer Education Program on Hepatitis B Screening Among Asian Americans in the Baltimore–Washington Metropolitan Area, 2009–2010. Preventing chronic disease. 2014;11.
29.van der Veen YJ, Voeten HA, de Zwart O, Richardus JH. Awareness, knowledge and self-reported test rates regarding Hepatitis B in Turkish-Dutch: A survey. BMC public health. 2010;10:512. PubMed PMID: 20735831. Pubmed Central PMCID: PMC2940913. Epub 2010/08/26. eng.
30. Jun DW, Cho YK, Sohn JH, Lee CH, Kim SH, Eun JR. A study of the awareness of chronic liver diseases among Korean adults. The Korean journal of hepatology. 2011 Jun;17(2):99-105. PubMed PMID: 21757980. Pubmed Central PMCID: PMC3304642. Epub 2011/07/16. eng.

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