

ORIGINAL ARTICLE

PERCEPTION OF HEPATITIS B AND ADULT HEPATITIS B VACCINATION: A PILOT STUDY AMONG MALAYSIAN HOUSEHOLDS USING MALAY VERSION QUESTIONNAIRE

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ABSTRACT

Hepatitis B (HB) is an upcoming health issue in Malaysia. Even though the Expanded Programme on Immunisation (EPI) for HB vaccination implemented by the Malaysia government in 1989, individuals born before 1989 were not covered under the EPI and should immunised against the HB virus. Examining the Malaysians' perception of vaccination is very important in order to determine their behaviour regarding HB vaccination. Most of the studies only gave priority to analysing this issue from an occupational risk perspective, consumers' perceptions of the HB vaccination are still lacking. This study is aimed at assessing the validity and reliability of the Malay version of the perception questionnaire used for Malaysian households. A pilot study involving 300 respondents was conducted in six districts in the Selangor area. Factor analysis constructed four components: perceived sustainability, perceived severity, perceived benefit and perceived barriers loaded on the corresponding component with factor loading of more than 0.5. Principal component analysis of the finalised 13 items explained the instrument of the variance, which was 59.7% in total, 20.3%, 14.5%, 12.5% and 12.4% explained by the four constructs. The Cronbach alpha for the items instruments is 0.5 to 0.8 which shows that moderate internal consistency exists and demonstrates reliability of the questionnaire. The frequency of the four constructs shows that most of the respondents worry about getting infected with HBV, the perceived severity level is high among respondents, they perceived benefit from getting an HB vaccination and perceived low barriers to getting the HB vaccination.

Keyword: Vaccine perception, Adult Hepatitis B vaccination, Health Belief Model, Validity, Reliability, Factor analysis

INTRODUCTION

Hepatitis is a viral infection that results in the inflammation of the liver. The World Health Organisation (WHO) estimated that 240 million people chronically were infected by the Hepatitis B virus (HBV), especially in low and middle-income countries; 650,000 individuals die each year due to liver cirrhosis or hepatocellular carcinoma¹. In Malaysia, an estimated one million nationals are chronically infected with HBV². It can be said that the Expanded Programme on Immunisation (EPI) implemented by the Malaysian government in 1989 was an HB vaccination initiative for infants^{2,3}. Among individuals born before 1989 (and therefore were not covered under the compulsory HB vaccination programme) are currently aged or more. These Malaysians should be immunized against the HBV so that they may prevent

infection and promote a healthy and, therefore, productive workforce.

Medical occupations in Malaysia should require that all medical personnel have compulsory HB vaccinations due to their exposure to the HBV and its occupational risk. Most health care workers are aware of the risk of HB^{4, 5}, but initially, it was not well received by Malaysian dental practitioners, for example, due to their fear of plasma-derived HB vaccines⁶. Examining the Malaysians' perception of vaccination is there for every important to determine their behaviour regarding immunisation, especially for the HB vaccination. It is obvious therefore that the adult immunization practices and risk perception important in understanding of decision making on immunization to prevent the spread of immunological diseases⁷. In fact, most of the HB infections among medical staff are caused by direct exposure from HB infected patients⁸. Because most of the studies only

gave priority to analysing this issue from an occupational risk perspective, consumers' perceptions for Hepatitis B vaccination is still lacking. Nevertheless, Larson et al⁹ highlighted that public trust on vaccination always changes and it depends on vaccine perception, vaccine risk experiences of getting the vaccine, religious or political situations and socioeconomic status.

Perception is described as an individual's belief regarding his or her own 'attributes' and 'interpretation' of behaviour¹⁰. Belief has a relationship between socialization and behaviour¹¹. Individual belief is based on an individual's characteristics that can be observed through one's behaviour and primary socialization. Lewin's "seminal field theory 1935" is one of the earliest theories in health behaviour¹². The theories of Kurt Lewin explained that an individual's behaviour depends on the individual and the environment¹³. The Health Belief Model (HBM), developed by Godfrey Hochbaum, is based on Kurt Lewin's theories and explain that the perception of an individual is a very important determinant in individual reaction¹⁴. In this study, the perception of an individual on HB and adult HB vaccination was analysed using the Health Belief Model.

METHODS

The original questionnaire was developed in English language based on a literature review. The final versions of the questionnaire consisted of 33 questions. Questions on household perception were presented to respondents with a seven-point Likert scale with the choice of 1 for 'strongly disagree' and 7 for 'strongly agree' answer format.

Validity

In order to determine construct validity, the questionnaire was developed based on a literature review with a few more questionnaires added related to the study in the English language during the first stage. At the second stage, the English language questionnaire was translated into the Malay language. At the third stage, a panel consisted of medical microbiology, public health medicine and nephrology medical experts who were appointed to moderate and validate the content of the questionnaire. A series of discussion sessions were carried out face to face with moderators before concluding the pilot version of the revised questionnaire at the fourth stage. At the final stage, the finalized questionnaire was used for pilot testing.

Data collection

The questionnaire consists of two parts. The first part consists of socio-demographic information

and the second part focuses on perception of Hepatitis B infection and the Hepatitis B vaccination. The data was collected randomly from six districts, namely Kajang, Cheras, Cyberjaya, Batu Caves, Rawang and Klang. The pilot test was conducted via face to face with 300 households selected randomly in these areas. The selection of the sample size for the pilot test was based on Nunnally¹⁵, who recommended 300 subjects for factor analysis.

Statistical analysis

The data were analysed using Statistical Package for Social Sciences (SPSS) version 22. The frequency analysis was conducted for each socio demographic parameter, such as age, gender, race, marital status, employment status, education level, number of family members and household income. For the reliability test, the corrected item-total correlation using Cronbach alpha coefficient was conducted to ensure internal consistency. This study also employed Cronbach alpha to evaluate validity and accuracy of the questionnaire. This approach was recommended by Tavakol and Dennick¹⁶. Factor analysis was conducted to finalize the items in the analytic construct.

RESULTS

A total of 300 households participated in this study. The majority of respondents were male 57% (n= 172); females represented 43% (n=128) of the sample. The mean (SD) age of households was 41.5 (11.82) years; min = 25; max = 83; mode 32. The vast majority of respondents were Malay 61% (n= 182), followed by Chinese 27% (n=82), Indians 12% (n=35) and others 1% (n=1). Most of respondents were married 79% (n=236), had a secondary education 51% (n=153) and were self-employed 28% (n=84) (Table 1).

Factor Analysis

All requirements for factor analysis were fulfilled. The Kaiser-Meyer-Olkin criterion was 0.727, which indicated accuracy of our sample size to conduct principal component analysis (PCA) and Bartlett's test was significant (Chi-square = 889.06; degree of freedom = 78; p<0.001). The PCA with VARIMAX rotation was performed for the 33 items (6 items from the construct of perceived susceptibility, 8 items from the perceived severity construct, 6 items from perceived benefit construct and 13 items from perceived barriers construct). For the VARIMAX rotation method, all items showed clear loading (>0.60) on one of the four factors loading (Table 2). However, loading of 0.5 and more are considered acceptable (Hair et al., 1987).

Table 1: Socio demographic characteristics of household

Variable	Frequency	Percentage (%)
Gender		
Male	172	57
Female	128	43
Age		
25-34	101	34
35-44	84	28
45-54	67	22
55-64	36	12
65 and above	12	4
Ethnicity		
Malay	182	61
Chinese	82	27
Indian	35	12
Others	1	1
Marital status		
Married	236	79
Single	52	17
Widow	3	1
Divorced	9	3
Employment status		
Self-employment	84	28
Private sectors	70	23
Unemployed	63	21
Public sectors	43	14
Retired	23	8
Student	5	2
Others	12	4
Educational level		
Never been to school	5	1
Primary	17	6
Secondary education	153	51
Diploma/ certificate	66	22
Degree holder	44	15
Postgraduate	15	5
Family income		
< RM1000	22	8
RM1001- RM2000	61	20
RM2001- RM3000	64	21
RM3001- RM4000	47	16
RM4001- RM5000	39	13
>RM5001	67	22

The four extracted dimensions with PCA of the 33 items explain 39% of total variance with 14.8% explained by perceived susceptibility, 9.2% by perceived severity, 7.5% by perceived benefit and 7.5% by perceived barriers. PCA of the finalised 13 items explained the instrument of the variance, which was 59.7% in total, with 20.3% (perceived susceptibility), 14.5%

(perceived severity), 12.5% (perceived benefit) and 12.4% (perceived barriers) explained by the four constructs (Table 3). Based on the initial PCA of 33 items, 20 items were deleted (3 items from perceived susceptibility, 5 items from perceived severity, 2 items from perceived benefit and 10 items from perceived barriers).

Table 2: Result of the VARIMAX rotated factor loading matrix

Statement	Component			
	1 "Perceived susceptibility"	2 "Perceived severity"	3 "Perceived benefit"	4 "Perceived barriers"
PS3			0.737	
PS4			0.795	
PS5			0.552	
PSE2		0.784		
PSE3		0.765		
PSE6		0.709		
PBE2	0.751			
PBE3	0.789			
PBE4	0.857			
PBE5	0.738			
PB6				0.706
PB8				0.724
PB13				0.712

Table 3: Variance explained by components

Component	Extraction sums of squared loadings		
	Total	% of variance	Cumulative %
33 items instrument			
1	4.9	14.8	14.8
2	3.0	9.2	23.9
3	2.5	7.5	31.5
4	2.5	7.5	39.0
13 items instrument			
1	2.6	20.3	20.3
2	1.9	14.5	34.8
3	1.6	12.5	47.2
4	1.6	12.4	59.7

Reliability and validity of perception

The result of Cronbach alpha revealed that items in the four (4) components were internally reliable and indicated that items within the components were highly interrelated with Cronbach alpha more than 0.5 for each subscale (Table 4).

Most of the respondents neutral in perceived that they less likely than most people to get infected with HB (n= 61; 20.3%) and their body could fight off HB infection (n= 58; 19.3%). Nevertheless, most of respondent strongly disagree that they never worry about getting infected with HB (n = 74; 24.7%). This shows that most of the respondents worry about getting infected with HBV.

The vast majority of households strongly agree and perceived that their ethnic group is at higher risk (n=123; 41%) than other ethnicities, HB infection is a serious disease (n=164; 54.7%), and also belief that there is cure for HB infection (n=

128; 42.7%). This show that the household perceived seriousness with HB infection.

Most of the households strongly agree that HB vaccination reduces worry about liver diseases (n=115; 38.3%), believe in the effectiveness of current HB vaccinations (n=106; 35.3%); that the HB vaccination strengthens the immune system against HBV (N=112; 37.3%) and that getting the HB vaccine is a good way to protect themselves from HBV infection (n= 120; 40%). This shows that most of the respondents know about the benefit of the HB vaccination.

Households strongly disagree with the statement where to get the HB vaccination (n=104; 34.7%), vaccination not effective for them (n = 84; 28%) and that their body can be weakened because of too many vaccinations (n=58; 19.3%). This shows that most of the households know where to get an HB vaccination, they believe that vaccination is effective for them and their body not be weakened by vaccination.

Table 4: Frequency, percentage and Cronbach alpha for each item

Subscales and items	n (%)						
	Strongly disagree	Disagree	Some what disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
Perceived Susceptibility (Cronbach alpha = 0.508)							
PS3 I am less likely than most people to get infected with HB	38 (12.7%)	44 (14.7%)	30 (10%)	61 (20.3%)	36 (12%)	54 (18%)	37 (12.3%)
PS4 My body could fight off HB infection.	43 (14.3%)	43 (14.3%)	24 (8%)	58 (19.3%)	55 (18.3%)	45 (15%)	32 (10.7%)
PS5 I never worry about getting infected with HB	74 (24.7%)	58 (19.3%)	28 (9.3%)	30 (10%)	34 (11.3%)	35 (11.7%)	41 (13.7%)
Perceived Severity (Cronbach alpha = 0.678)							
PSE2 I belief that my ethnic group at higher risk of HB infection	11 (3.7%)	24 (8%)	22 (7.3%)	17 (5.7%)	32 (10.7%)	71 (23.7%)	123 (41%)
PSE3 I belief that HB infection is serious disease	7 (2.3%)	9 (3%)	18 (6%)	29 (9.7%)	31 (10.3%)	42 (14%)	164 (54.7%)
PSE6 I believe that there is a cure for HB infection	13 (4.3%)	15 (5%)	11 (3.7%)	9 (3%)	36 (12%)	88 (29.3%)	128 (42.7%)
Perceived Benefit (Cronbach alpha = 0.823)							
PBE2 If I take the HB vaccine it will reduce my worry about liver disease	6 (2%)	7 (2.3%)	15 (5%)	24 (8%)	40 (13.3%)	93 (31%)	115 (38.3%)
PBE3 I believe on the effectiveness of HB vaccine now	12 (4%)	9 (3%)	9 (3%)	38 (12.7%)	61 (20.3%)	65 (21.7%)	106 (35.3%)
PBE4 I believe a vaccine HB strengthen immune system against HBV	8 (2.7%)	12 (4%)	11 (3.7%)	27 (9%)	45 (15%)	85 (28.3%)	112 (37.3%)
PBE5 I believe that getting Hepatitis B vaccine is a good way to protect yourself from HBV infection	9 (3%)	12 (4%)	19 (6.3%)	15 (5%)	37 (12.3%)	88 (29.3%)	120 (40%)
Perceived Barriers (Cronbach alpha = 0.535)							
PB6 I believe that vaccination is not effective for me	83 (27.7%)	84 (28%)	28 (9.3%)	43 (14.3%)	35 (11.7%)	11 (3.7%)	16 (5.3%)
PB8 I don't know where to get the HB vaccine	104 (34.7%)	48 (16%)	23 (7.7%)	17 (5.7%)	24 (8%)	34 (11.3%)	50 (16.7%)
PB13 I believe that my body's immune system can be weakened because too many vaccinations	58 (19.3%)	60 (20%)	24 (8%)	57 (19%)	35 (11.7%)	34 (11.3%)	32 (10.7%)

DISCUSSION

The objective of this pilot study was to determine the reliability and validity of the Malay version of the perception questionnaire used among Malaysian households. Hair et al.¹⁷ defines reliability as the “extent to which variables or a set of variables is consistent in what it is intend to measure” (pp.93). A Cronbach’s alpha value of 0.5 and higher is considered acceptable¹⁸, however, a score of 0.6 and 0.7 is a good indicator of reliability¹⁷. The reliability of the questionnaire for this study was considered to have moderate internal consistency¹⁹ and has sufficient to acceptable value for research purposes¹⁵ because the overall Cronbach’s alpha was 0.6.

PCA of the finalised 13 items explained the instrument of the variance, which was 59.7% in total, with perceived sustainability being 20.3%, perceived severity 14.5%, perceived benefit 12.5% and perceived barrier 12.4%. The minimum acceptable factor loading can be 0.30 and above¹⁶ and 0.5 and more is considered acceptable¹⁷. However, in this study values of factor loading in the range of 0.5 to 0.8 which indicated an acceptable range.

The frequency analysis for each construct shows that Malaysian households do not know the risk of HB infection with the answer neutral for perceived sustainability. Yet, they know about the seriousness of HB infection with the answer strongly agree for perceived severity items with highest percentage. This study finding similar to a study conducted on across four Asian American group revealed that the household the highest perceived susceptibility and severity for HB infection²⁰. Moreover, household perceived benefit with HB vaccination reduce the chances of HB infection with the answer strongly agree for perceived benefit. Nevertheless, Malaysian household perceived that no obstacles to vaccinated with the answer disagree for perceived barriers items. This study finding supported by the new path of perceived barriers to perceived benefit of HB vaccination²¹, were if the household perceived no barriers will increase the perceived benefit of get HB vaccination.

CONCLUSION

This study shows that the Malay version of the perception questionnaire is valid and acceptable for determining the perceived

sustainability, perceived severity, perceived benefit and perceived barriers of HB and adult HB vaccination among Malaysian households.

Conflict of interest

The authors declare no potential conflict of interest.

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REFERENCE

1. Ministry of Health Malaysia. Health Facts 2014. Available from: <http://www.moh.gov.my/images/gallery/publications/HEALTH%20FACTS%202014.pdf>
2. Khairullah NS, & Merican DI. Hepatitis disease management programs in Malaysia. *Journal of gastroenterology and hepatology*, 2004; 19(S1),S13-S16
3. Ng KP, Saw TL, Baki A, Rozainah K, Pang KW, & Ramanathan M. Impact of the Expanded Program of Immunization against hepatitis B infection in school children in Malaysia. *Medical microbiology and immunology*, 2005; 194(3),163-168.
4. Hesham R, Zamberi S, Tajunisah ME, Ariza A, & Ilina I. Hepatitis B immunisation status among health care workers in two Kuala Lumpur hospitals. *The Medical journal of Malaysia*, 2005; 60(4), 407-410.
5. Lim HC & Rashwan H. Awareness of Hepatitis A and Hepatitis B among Residents in Kuala Lumpur and Selangor. *Malaysian Journal of Pharmacy*, 2003; 1(3), 76-85
6. Yaacob HB & Samaranyake LP. Awareness and acceptance of the hepatitis B vaccine by dental practitioners in Malaysia. *Journal of*

- Oral Pathology & Medicine 1989; 18(4), 236-239.
7. Hanslik T, Wechsler B, Vaillant JN, Audrain L, Prinseau J, Baglin A, & Flahault A. A survey of physicians' vaccine risk perception and immunization practices for subjects with immunological diseases. *Vaccine*, 2000; 19(7), 908-915.
 8. Holmberg SD, Suryaprasad A, Ward JW. Updated CDC recommendations for the management of hepatitis B virus-infected health-care providers and students. *Morbidity and Mortality Weekly Report: Recommendations and Reports*. 2012 Jul 6;61(3):1-2..
 9. Larson HJ, Louis ZC, Juhani Eskola, Samuel LK, and Scott Ratzan. "Addressing the vaccine confidence gap." *The Lancet*, 2011; 378, 201, 526-535
 10. Molden DC, & Dweck CS. Finding "meaning" in psychology: a lay theories approach to self-regulation, social perception, and social development. *American Psychologist*, 2006; 61(3), 192-201
 11. Abraham C, & Sheeran P. Predicting health behavior. In Conner, M & Norman, P (Eds), *The health belief model*, McGraw-Hill International, 2005; 28-80
 12. Rimer BK. Models of individual health behavior. *Health Behavior and Health Education: Theory, Research and Practice*, 2008; 41-45.
 13. Sansone C, Morf CC, & Panter AT (Eds.). *The Sage handbook of methods in social psychology*. Sage Publications. 2003.
 14. Hochbaum G, Rosenstock I, & Kegels S. Health belief model. United States Public Health Service. 1952.
 15. Nunnallyn JC, *Psychometric theory*, 1978; New York: McGraw-Hill.
 16. Tavakol M, & Dennick R. Making sense of Cronbach's alpha. *International journal of medical education*, 2011; (2)53-55.
 17. Hair JF, Black WC, Babin BJ, & Anderson RE. (2010). *Multivariate Data Analysis*. Seventh Edition, 2010. Prentice Hall, Upper Saddle River, New Jersey
 18. Bowling A. *Research methods in health: investigating health and health services*. McGraw-hill education (UK); 2014 Jul 1.
 19. Pielak KL, & Hilton A. University students immunized and not immunized for measles: a comparison of beliefs, attitudes, and perceived barriers and benefits. *Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique*, 2003; 193-196.
 20. Maxwell AE, Stewart SL, Glenn BA, Wong WK, Yasui Y, Chang LC, Taylor VM, Nguyen TT, Chen Jr MS, Bastani R. Theoretically informed correlates of hepatitis B knowledge among four Asian groups: the health behavior framework. *Asian Pacific journal of cancer prevention: APJCP*. 2012;13(4):1687.
 21. Rajamoorthy Y, Radam A, Taib NM, Rahim KA, Wagner AL, Mudatsir M, Munusamy S, Harapan H. The relationship between perceptions and self-paid hepatitis B vaccination: A structural equation modeling approach. *PLoS One*. 2018 Dec 6;13(12):e0208402.