Prediction of Preventive Behaviors of Hepatitis B among Nurses; Insights from the Theory of Planned Behavior

Mehdi Mirzaei-Alavijeh

Kermanshah University of Medical Sciences

Fatemeh Jalilian

Kermanshah University of Medical Sciences

Farzad Jalilian (✉ f_jalilian@yahoo.com)

Kermanshah University of Medical Sciences

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Abstract

Background Hepatitis B is the cause of the majority of acute and chronic infections, liver cirrhosis and liver cancer in the world. The purpose of current research was to investigate the hepatitis B (HB) preventive behaviors in nurses in west of Iran by using the theory of planned behavior (TPB). Methods This cross-sectional research was conducted on 330 nurses from five teaching and treatment hospitals in Kermanshah who were randomly selected. Data were collected by self-report questionnaire. Data were analyzed in the SPSS-16 software by using bivariate correlation, t-test, ANOVA, and linear regression statistical tests. Results The mean score for the prevention behaviors of HB was 3.14 ± 1.45 , and the participants achieved 62.8% of the maximum obtainable score for the prevention behaviors of HB. TPB constructs were accounted for 22% of the variation in prevention behaviors of HB, $F = 42.351$, $P < 0.001$ and among the TPB constructs, attitude and perceived behavior control were the most influential predictors of doing prevention behaviors of HB. Conclusions This research provides a foundation for planning health promotion program to increase the prevention behaviors of HB. It seems our findings are useful in planning health promotion programs aimed at increasing attitude and perceived behavior control to increase the prevention behaviors of HB.

Background

Hepatitis B (HB) is the second common cause of acute hepatitis and the HB virus (HBV) is the causes of cirrhosis and Hepatocellular carcinoma (1). In the world, about 360 million people are suffering from chronic HB infection, and near 90% of the carriers living in developing countries and more than 600,000 people die annually in the world (2). Iran is a country with a moderate prevalence of chronic infection of HB, and near 30% of the Iranian population have a history of HBV infection and about 1.5 to 2.5 percent of them are chronic carriers (3). HB is the most common occupational health problem in health care workers and its annual incidence in hospital staff is 0.1%, which is about ten times higher than in the normal population (4). The health care worker who deal with the blood and body fluids of the infected patients are more at risk, and the risk is about 33% in injuries caused by shading and sharp objects (5). HBV transmitted through coetaneous damage, contact with blood products, saliva, semen, tears and other contaminated infections of the body (6). Most cases of chronic HB are asymptomatic, and most people are not aware of their disease, therefore it's a silent epidemic (7). HB creates a huge financial burden, but the infection can be prevented (8). According to the high prevalence, serious consequences and costs of disease, it seems that developing and implementing prevention programs are necessary (9). The most important methods to the prevention of HB include; providing educating and vaccination the at-risk groups (10). Therefore, situation analyses and understanding the preventive behaviors of HB among the at-risk group are necessary for the starting of planning programs, and previous research indicated that the most effective programs are evidence and theory-based which rooted in behavior change science (11). In this regard, the theory of planned behavior (TPB) was used in behavior change analyses; this theory presented by Ajzen and Fishbein, and according to TPB, the primary determinant of behavior is behavioral intention, which expresses "the individual's motivation for adopting a behavior" and the

behavior intention predicted by three determinants of 1) attitude 2) subjective norms; and 3) perceived behavioral control (12). The TPB has been used in many studies in various fields, such as prevention behaviors of HB (13-20).

Therefore, considering the importance of understanding effective determinants in the adoption of preventive behaviors of HB in the development, implementation, and evaluation of preventive programs, the purpose of the current research was to investigate the HB preventive behaviors prediction in nurses based on TPB constructs.

Methods

Participants and procedure

This cross-sectional research was conducted on 330 nurses from five teaching and treatment hospitals in Kermanshah who were randomly selected. Data were collected by self-report questionnaire. Considering the various hospitals (Imam Reza, Imam Ali, Imam Khomeini, Farabi, Taleghani) as clusters, samples were chosen randomly based on the probability proportional to the size of each cluster. The nurses who work in Kermanshah hospitals were eligible to participate in this study.

Measures

The data collection questionnaire consisted of three parts, which are described below.

The first part contains information about 5 subjects including age (years), sex (male, female), level of education (technician, BSc, MSc), job history (month), and positive history of HB in the family (yes, no).

TPB scale was designed based on standard questionnaires (13-20) and included 16 items under four constructs including (a) attitude; (b) subjective norms; (c) perceived behavior control; and (d) behavioral intention.

Five items were designed to measure attitude towards preventive behaviors of HB (e.g. "If I performed prevention behaviors of HB, it would help me to the prevention of HB"). Three items were designed for subjective norms towards preventive behaviors of HB (e.g. "If I performed prevention behaviors of HB, my family will confirm it."). Three items were designed to measure perceived behavior control regarding preventive behaviors of HB (e.g. "I believe that I can manage myself to performed preventive behaviors of HB"). The behavioral intention to preventive behaviors of HB was measured by five items (e.g., I intend to uptake the HB vaccine). In order to facilitate participants' responses to the items, attitude, perceived behavior control, and behavior intention items were standardized to a five-score Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Subjective norms items were standardized to a yes (1) or no (0) scale.

The third part included a question regarding the prevention behaviors of HB. To assess whether or not the nurses had performed HB preventive behaviors, we used their responses five questions about the HB

prevention behaviors, such as uptake HB vaccine, items were standardized to a yes (1) or no (0) scale.

Statistical Analysis

Data were analyzed in the SPSS-16 software by using bivariate correlation, t-test, ANOVA, and linear regression statistical tests. Cronbach's Alpha and split half was used to estimate the internal consistency of the various measures.

Results

The range of participant's age was from 20 to 58 years with the mean of 30.5 years [95% CI: 29.8, 31.3], ranged from 20 to 58 years. The mean job history of respondents was 79.91 months [95% CI: 72.29, 87.54], ranged from 2 to 360 month. More information towards the demographic characteristics and the association between demographic characteristics with prevention behaviors of HB are shown in Table 1. In addition, the prevention behaviors of HB score was 3.14 ± 1.45 , and the participants achieved 62.8% of the maximum obtainable score for the preventive behaviors of HB.

Table 2 shows the mean (SD), range and correlations between TPB constructs and prevention behaviors of HB. Significance levels at the 0.01 and 0.05 were the criteria for the analysis.

Table 3 shows 22% of the variation in the prevention behaviors of HB, $F = 42.351$, $P < 0.001$ was predicting by the TPB constructs. Moreover, among the TPB constructs: attitude and perceived behavior control were the most influential predictors of doing prevention behaviors of HB.

Table 4 has been shown the answer to the preventive behaviors of HB items among participants.

Discussion

The main aim of our research was to determine socio-cognitive determinants related to preventive behaviors of HB among nurses in the west of Iran based on TPB. Our findings showed that positive attitude and perceived behavior control were the most influential predictors of doing prevention behaviors of HB.

Based on our findings among the background variables, positive history of HB in family, women gender and higher education level were significantly associated with performed prevention behaviors of HB. Moreover, our result indicated the 58.5% of nurses in this study had completed HB vaccination as the most important of the prevention behaviors of HB, which is similar to other studies in the field investigating the HB vaccination status among healthcare workers (21, 22).

The positive family history of HB was related to a performed higher score of preventive behaviors of HB. Consistent with the findings of our study, the findings of the studies by Adekanle et al carried out research on hospital workers in Ethiopia and indicated risk perception was the main determinant of HB preventive behaviors (23). In addition, Yousafzai et al in their study indicated perceived threat as the predictor of

sharps injuries among health care workers (24). It seems participants who had a positive history of HB in the family, had a high level of perceived risk towards HB.

Another finding of our study indicated the score of preventive behaviors of HB among women was significantly much more than among men. These findings suggested that men compared to women are more in need of getting information about the important role of preventive behaviors of HB.

Our study also showed that the preventive behaviors of HB were associated with higher education, which is in line with the findings of earlier studies investigated the HB prevention behaviors among health care workers. For example, Karaivazoglou et al in their study among health care personnel in southwestern Greece indicated a positive association between HB vaccine acceptability and higher education level (25). In general, higher education level is the predictor of the probability of performing healthy behaviors (26). According to these findings, it seems that particular attention must be paid to people with a lower education level while planning educational programs.

Several studies have shown that the TPB constructs can explain health behaviors such as preventive behaviors of HB (13-20). In this regard, Askelson et al reported attitude was the best predictor of mothers' intentions to vaccinate their daughters of Papillomavirus (13). The significant role of attitudes has been cited in previous human HPV vaccine acceptability studies (18, 20). Because of the importance of healthcare workers attitudes on preventive behavior, further study should explore ways to influence their attitudes.

As well as, our results showed that perceived behavioral control was a strong predictor for the prevention behaviors of HB. Several studies indicated perceived behavior control or self-efficacy as a strong predictor for explains healthy behaviors. For example, Kahn et al in their study reported the efficacy was the primary factor driving participants' decisions about recommending HPV vaccines (27). Moreover, Gerend et al carried out research among women ages 18–26 and reported self-efficacy as a key predictor of human HPV vaccine uptake (15). Also, Roberto et al indicated pediatricians have positive PBC toward encouraging parents to get their daughters vaccinated against HPV (17). These findings provide a foundation for planning health promotion program targeting health care workers in doing the prevention behaviors of HB.

Finally, our findings indicated TPB variables were statistically significant for predicting the prevention behaviors of HB which, they were accounted for 22% of the variation in the prevention behaviors of HB. In this regard, Juraskova et al indicated the TPB constructs predicted 54% of the variance in HPV vaccination intention (16). Moreover, Bennett et al carried out research in 143 women at a Midwestern university and indicated social-cognitive predictors including health belief model (HBM) and TPB constructs explained 60% of the human HPV vaccine in intentions (19).

Conclusion

This research provides a foundation for planning health promotion program to increase the prevention behaviors of HB. Further research should explore ways to influence healthcare workers perceived behavior control and attitudes towards doing the prevention behaviors of HB.

Abbreviations

HB	Hepatitis B
HBV	Hepatitis B virus
TPB	Theory of Planned Behavior
HBM	Health Belief Model

Declarations

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Availability of data and material:

Please contact the corresponding author for data requests.

Authors' contributions

FJ and MMA contributed to the conception and design of the research; FJ, MMA and FJ contributed to the acquisition and analysis of the data; FJ contributed to the analysis and interpretation of the data; FJ, MMA, and FJ contributed to the acquisition, analysis, and interpretation of the data; All authors approved the final manuscript.

Ethics approval and consent to participate

The nurses signed the consent form and voluntarily agreed to participate in the study, which has been approved by the ethics research committee at the Kermanshah University of Medical Sciences (KUMS.REC.1395.746).

Consent for publication

Not applicable.

Competing interests

The authors have no conflicts of interest to declare.

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Tables

Table 1: Association between demographic characteristics and prevention behaviors of HB

Variables	Number	Percent	Mean	SD	P
Age group (year)					
20-29	154	51.5	3.32	1.45	0.071
30-39	114	38.1	2.91	1.40	
40-60	31	10.4	3.12	1.52	
Education level					
Technician	15	5	2.33	1.11	0.035
Bsc	269	90	3.16	1.45	
MSc	15	5	3.66	1.44	
Sex					
Men	104	34.8	2.74	1.52	< 0.001
Women	195	65.2	3.36	1.37	
Positive history of HB in family					
Yes	25	8.4	3.76	1.36	0.027
No	270	91.6	3.09	1.45	

Table 2: Correlation between different components of HB

Components	Mean (SD)	Range	X1	X2	X3	X4
X1. Attitude	18.60 (4.8)	5-25	1			
X2. Subjective norms	1.95 (0.96)	0-3	0.263**	1		
X3. Perceived behavioral control	12.26 (1.99)	3-15	0.259**	0.149*	1	
X4. Behavioral intention	17.93 (4.73)	3-15	0.630**	0.150**	0.179**	1
X5. Preventive behaviors of HB	3.14 (1.45)	0-5	0.427**	0.167**	0.305**	0.289**

* P < 0.05 ** P < 0.01

Table 3: Linear regression analysis for TPB variables related to doing prevention behaviors of HB (final model: step 3)

Model	Un-standardized Coefficients		Standardized Coefficients		t	P
	B	Std. Error	Beta			
Attitude	0.112	0.016	0.373	7.028	< 0.001	
Perceived behavior control	0.151	0.039	0.208	3.918	< 0.001	

Table 4: Preventive behaviors of HB items among participants

Yes	No	
n (%)	n (%)	
175 (58.5 %)	124 (41.5 %)	Complete vaccination against hepatitis B infection
155 (51.8 %)	144 (48.2 %)	Measuring the antibody-titer (anti-HBs) after vaccination against hepatitis B virus
219 (73.2 %)	80 (26.8 %)	Washing hands before and after taking care of patients
197 (65.9 %)	102 (34.1 %)	Action required in the event hand infected of blood patients
195 (65.2 %)	104 (34.8 %)	Prevention of needle-stick injury