

# Psycho-social Determinants of Hepatitis B Preventive Behaviors Among Nurses

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## Abstract

**Background:** Hepatitis B (HB) is one of the important common occupational diseases, and health care workers are one of the most at-risk groups. The current study aimed to investigate the best psycho-social predictors of HB preventive behaviors among nurses by using the theory of planned behavior (TPB).

**Methods:** The current research was a cross-sectional study. An anonymous self-reported scale according to the TPB determinants was distributed among 330 nurses in Kermanshah, and 299 (90.6%) questionnaires were returned. Nurses were randomly selected among different teaching hospitals in Kermanshah in 2016. Data were analyzed by SPSS version 16 using Pearson correlation, one-way analysis of variance, independent samples *t* test, and linear regression tests.

**Results:** The mean score for the HB preventive behaviors was  $3.14 \pm 1.45$  ranging from 1 to 5. The TPB determinants accounted for 21% of the variance in nurses' HB preventive behaviors. Attitude and perceived behavior control (PBC) were the best determinants of performing HB preventive behaviors. Furthermore, higher education level, gender (female), and family history of HB were effective in the higher score of HB prevention behaviors ( $P < 0.001$ ).

**Conclusion:** In developing programs and policies to prevent HB among nurses in Iran, attitude and PBC should be considered. These findings may guide HB interventions to improve the capacity to seek HB preventive behaviors.

**Keywords:** Hepatitis B, Attitude, Nurses

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## Introduction

Hepatitis B (HB) is an acute infection of the liver (1,2). HB causes many physical and mental complications in affected patients and affects their quality of life (3). More than two billion people in the world are infected with hepatitis B virus (HBV), of which two hundred and forty million are chronic carriers, and more than one million die each year from HBV complications (4). Statistics show that chronic HBV infection is responsible for approximately 42% of all deaths from liver cancer (5). It is a global health issue because 66% of people in the world live in regions with high levels of infection (6). However, Asia and sub-Saharan Africa have the highest incidence of chronic HB infection, and more than three-quarters of the population with chronic HBV infection worldwide live in these countries (7). Contact with the

infected person's blood or other body fluids is the main route of transmission of HBV, and other methods of transmission include toothbrushes, syringes, needles, use of contaminated razors or other injection equipment, and direct contact with the infected person's open wounds (8). Carriers are the main sources of HBV transmission and the HBV infection geographically (1-10%); according to this criterion, countries are divided into low (less than 2%), intermediate (between 2 to 5%), and high (more than 5%) regions, and Iran is in the second region of these countries with an intermediate level of infection (9).

Further, HB is one of the most common occupational diseases, and health care workers are one of the most important at-risk groups. Further, 40% of HB infections are due to occupational hazards, and the estimated incidence of HB in healthcare workers (HCWs) is two



to four times more than that in the public population (10). Approximately two million HCWs are at risk of occupational HB disease annually (11); nonetheless, HB is a preventable disease (12). Statistics indicate that about 70 000 of HCWs are infected with HBV annually, and nearly 90% of these infections occur in developing countries (13). Therefore, it is important to recognize the status of HB preventive behaviors among the nurses in needs assessment in order to develop and implement health promotion programs; on the other hand, theories and models help us understand the relationship between the determinants of behavior and how these affect behavior (14). The theory of planned behavior (TPB) is one of the most common theories that have been successfully used to explain and predict behavior in many health problems as proposed by Icek Ajzen. According to the TPB, the most important determinant of behavior is intention. The intention is predicted by three determinants: attitude (positive or negative evaluation of a behavior or situation), subjective norms (SNs), namely, perception of other people about behavior or situation, and perceived behavior control (PBC) which refers to the sense of control over behavior (15). A review of previous studies has revealed that TPB is used to understand the beliefs and attitudes associated with performing protective behaviors against HB (16-20). The current study aimed to investigate the psycho-social predictors of HB preventive behaviors among nurses by using the TPB.

## Materials and Methods

A cross-sectional study was conducted on 330 nurses from teaching hospitals (i.e., Imam Ali, Imam Reza, Farabi, Taleghani, and Imam Khomeini) affiliated with Kermanshah University of Medical Sciences (KUMS) in Kermanshah, located in the west of Iran in 2016. The following steps were performed for data collection. KUMS teaching hospitals were considered clusters and according to the probability proportional to the size of each cluster, the nurses were randomly selected. Finally, the questionnaire was given to the participants, and the data were collected as a self-report. The response rate was 90.6%, and only the nurses working in teaching hospitals affiliated with KUMS who did not have hepatitis B were eligible to participate in the current study. Refusal to sign informed consent was regarded as an exclusion criterion. The questionnaire consisted of three sections with a total of 27 items. The first part contained background variables including age (years), gender (female, male), job history (month), level of education (Associate, Bachelor of Sciences, Master of Sciences), and family history of HB (yes, no). The second part consisted of TPB determinant items (17 items) which were developed by standard questionnaires (16-20). Attitude towards HB preventive behaviors was measured by five items (e.g. Performing HB prevention behaviors such as vaccination, measuring anti-HBs, hand washing, protecting from needle sticking, and taking emergency measures if infected with a

patient's blood is effective in preventing HB infection). SN towards HB preventive behaviors was measured by three items (e.g., If I do prevention behaviors against HB, my supervisor will approve it.). Four items were designed to measure PBC toward HB preventive behaviors (e.g., It is easy for me to do HB preventive behaviors). Likewise, the intention for HB preventive behaviors was measured by five items (e.g., I intend to wash my hands before and after taking care of patients). The TPB determinant items were measured by a 5-point Likert-type scale. The third part contained information regarding the status of HB preventive behaviors and was assessed by five items, including HB vaccination (yes or no), measuring anti-HBs (yes or no), hand washing (yes or no), protecting from needle sticking (yes or no), and taking emergency measures if infected with a patient's blood (yes or no).

Face validity of TPB determinants was evaluated by the expert group. For this purpose, 12 experts (e.g., nurse, health educators and promoters, health policymakers, epidemiologist, psychologist, health services manager, and medical doctor) were interviewed face to face, and necessary modification was made based on their comments. The reliability of the instrument was also measured by Cronbach's alpha for attitude, SN, and PBC and by split half for HB preventive behavior questionnaire. Reliability for attitude, SN, PBC, intention, and behavior was estimated to be 0.89, 0.70, 0.84, 0.88, and 0.77, respectively. The data were analyzed by SPSS version 16 using Pearson correlation, one-way analysis of variance, independent samples t-test, and linear regression tests.

## Results

The average age of the investigated nurses was 30.5 years (standard deviation: 6.62), and the mean job history of nurses was 79.91 months (95% CI: 72.29-87.54). **Table 1** indicates the association between background variables and HB preventive behaviors. The HB preventive behavior

**Table 1.** The Relationship Between Background Variables and HB Preventive Behaviors

Variables	Number	Percent	Mean	SD	P Values
<b>Age group (y)</b>					
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	
<b>Education level</b>					
Associate	15	5	2.33	1.11	0.035
BS	269	90	3.16	1.45	
MS	15	5	3.66	1.44	
<b>Gender</b>					
Male	104	34.8	2.74	1.52	<0.001
Female	195	65.2	3.36	1.37	
<b>Family history of HB</b>					
Yes	25	8.4	3.76	1.36	0.027
No	274	91.6	3.09	1.45	

Note. HB: Hepatitis B; SD: Standard deviation; BS: Bachelor of sciences; MS: Master of sciences.

scores were  $3.14 \pm 1.45$  ranging from 1 to 5. These findings suggested that a higher education level, gender (female), and family history of HB are effective in performing HB prevention behaviors ( $P < 0.001$ ).

Table 2 presents the mean (SD), range, and correlations between TPB constructs and preventive behaviors of HB.

The results of linear regression analysis in Table 3 indicated that TPB determinates predict 21% of the variance in preventive behaviors of HB. Based on linear regression analysis, the best predictors for preventive behaviors of HB were attitude ( $\beta = 0.374$ ,  $P < 0.001$ ), and PBC ( $\beta = 0.213$ ,  $P < 0.001$ ). Intention and SN were excluded from the equation, as these determinates did not achieve statistical significance.

The scores related to the HB preventive behavior items are presented in Table 4.

### Discussion

This study aimed to evaluate the beliefs associated with performing HB preventive behaviors in nurses of teaching hospitals in Kermanshah in western Iran. It was found that attitude and PBC are two strong determinants of HB prevention behaviors. The findings showed that SN is not a good predictor for performing HB preventive behaviors. The obtained results are largely in line with other studies (17-21). Consistent with the present findings, Askelson et al in their study on rural mothers in a Midwestern state found that attitude is the most important predictor of mothers' intention to vaccinate their daughters against

human papillomavirus (17). Mursy and Mohamed carried out a study on 110 nurses and midwives in Sudan and reported that the majority of nurses (86.4%) have a favorable attitude toward the preventive behaviors of HBV infection (18). Consistent with our findings, van der Veen in his study on Turkish Dutch found that attitude and PBC are strong determinants of screening for HB (19). Likewise, Baars et al reported that PBC was the only effective structure for participating in the free HB vaccination program among drug users in the Netherlands, emphasizing that programs to promote HB protection behaviors should focus on promoting PBC (20). Furthermore, Catalano et al conducted a study aimed at predicting the HB vaccination intention by using TPB, finding that attitude was a significant predictor of intention (21). Moreover, Mcgrane and Staines in their study on nursing staff in Dublin, Ireland, indicated vaccine benefits as one of the most important factors influencing the decision to accept hepatitis B vaccination (22). The results of the present study are consistent with the TPB, suggesting that people will be more likely to take preventive measures if they are confident in their ability to prevent HBV. It can also be concluded from the results that the more positive beliefs about the benefits of HB preventive behaviors among nurses, the more likely they are to engage in these behaviors. These findings can guide the design and implementation of promotion programs for HB preventive behaviors among nurses.

The present findings also showed that higher education

**Table 2.** Correlation Between TPB Determinates

Determinates	Mean (SD)	Score Range	Attitude	SN	PBC	Intention
Attitude	18.60 (4.8)	5-25	1			
SN	8.15 (1.27)	3-15	0.183**	1		
PBC	16.53 (2.60)	4-20	0.246**	0.160*	1	
Intention	17.93 (4.73)	5-25	0.630**	0.078	0.180**	1
HB preventive behaviors	3.14 (1.45)	0-5	0.427**	0.185**	0.305**	0.289**

Note. TPB: Theory of planned behavior; SD: Standard deviation; SN: Subjective norm; PBC: Perceived behavior control; \*  $P < 0.05$ ; \*\*  $P < 0.01$ .

**Table 3.** Multiple Linear Regression Analysis to Explain the Variation in the HB Preventive Behaviors Based on TPB Determinates as Predictors

Dimension	Variables	Coefficient	Standard Error	Coefficient $\beta$	t	P	R	R <sup>2</sup>
HB preventive behaviors	Attitude	0.112	0.016	0.374	7.093	<0.001	0.22	0.21
	PBC	0.119	0.030	0.213	4.029	<0.001		
Excluded variables	SN	0.098	0.060	0.086	1.648	0.100		
	Intention	0.009	0.020	0.030	0.450	0.653		

**Table 4.** HB Preventive Behavior Items Among Nurses

HB Preventive Behaviors Items	Yes n (%)	No n (%)
Complete vaccination against HB	175 (58.5)	124 (41.5)
Measuring the anti-HBs	155 (51.8)	144 (48.2)
Hand washing before and after taking care of patients	219 (73.2)	80 (26.8)
Doing necessary measures in case of hand contamination with HB patients' blood	197 (65.9)	102 (34.1)
Protecting needle-stick injury	195 (65.2)	104 (34.8)

Note. HB: hepatitis B.

level, female gender, and family history of HB are effective in performing HB preventive behaviors. A review of the literature largely confirms the findings of the present study (23-26). In this regard, d'Uva et al noted that the status of health behaviors is generally better in people with higher education (23). Other studies also reported a lower prevalence of poor health in low-educated groups than in high-educated groups (24). The education level predicts the likelihood of performing health behaviors (25). Karaivazoglou et al in their research on HCWs in Greece reported a positive relationship between uptake of HB vaccine and education level (26). Therefore, in implementing health promotion programs, attention should be paid to educational inequalities among the target group of the program.

Moreover, the findings revealed that a family history of HB is effective in better performance of HB prevention behaviors. Previous studies have evidenced that health or preventive behaviors are more prevalent among people who have a sick person in the family (27,28). These people may be more aware of the risk of the disease and, consequently, more willing to engage in preventative behaviors.

Some studies have also reported gender differences (albeit small) in health status or health behaviors (29), but there is no clear evidence for gender differences in health status (24). However, health promotion programs should be sensitive to the gender of the target population.

This study had several limitations. First, data collected based on a self-report scale may be accompanied by a percentage of error. Second, the study was conducted only among a group of nurses in western Iran, and the findings may not be generalizable to other nurses in Iran.

## Conclusion

High positive attitude and PBC influenced HB preventive behavior performance among nurses. Accordingly, programs and policies geared towards enhancing HB preventive behaviors among nurses in the west of Iran should consider these determinants. Moreover, the findings of the current study may guide HB interventions aimed at improving the capacity to seek HB preventive behaviors.

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## Conflict of Interests

The authors hereby declare that they have no conflict of interests.

## Ethical Permissions

The subjects signed a consent form and voluntarily agreed to participate in the present study. The study was approved by the Ethics Committee of KUMS (KUMS.REC.1395.746).

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