

## EFFECT OF UNIVERSAL PRECAUTIONS INTERVENTION PROGRAM ON NURSES' KNOWLEDGE AND PRACTICES TOWARD HEPATITIS B VIRUS

**Fatma Mostafa Mahrous**

Medical-Surgical Nursing Department, Faculty of Nursing,

Ain Shams University, EGYPT.

[dr.fatma\\_mostafa@yahoo.com](mailto:dr.fatma_mostafa@yahoo.com)

### ABSTRACT

*Hepatitis B infection is a serious blood-borne disease caused by the hepatitis B virus (HBV) which attacks the liver, and is the leading cause of liver cancer and cirrhosis of the liver. HBV can be transmitted through exposure to infected blood and human secretions through needle stick / sharps injuries and splashes. Thus nurses are at high risk for HBV infection. Universal precautions are the infection control techniques that were recommended following the AIDS outbreak in the 1980s. Essentially it means that every patient is treated as if they are infected and therefore precautions are taken to minimize risk. No doubt, universal precautions are good hygiene habits, such as hand washing and the use of gloves and other barriers, correct sharps handling, and aseptic techniques. This study was aimed to evaluate the effect of universal precautions intervention program on nurses' knowledge and practice regarding hepatitis B virus. The study was conducted at Specialized Medical wards (Haemodialysis, medical department, Emergency medical) at Ain Shams University Hospital. Design: Quasi-experimental design was used. Sample: Total samples of 50 nurses were assigned to educational program. The results of this study emphasized that scores of knowledge and practice among studied subjects were increased after participation in the education program. Also the results of this study illustrated that there was statistically significant correlation between knowledge, practice and educational level. This study concluded that hepatitis B educational program improved knowledge and practice and decrease occupational risk from blood borne infection after implementation of program. This study recommended that continuing education programs are needed to increase awareness of hepatitis B virus in various risk groups in our country. Also replication of the study on a larger probability sample from different geographical areas should be done to achieve more generalizable results.*

**Keywords:** Hepatitis B virus, educational program, Universal precautions, Nurses

### INTRODUCTION

Hepatitis is an inflammatory disease of the liver which may be caused by the Hepatitis B virus (HBV). Hepatitis B is a global problem, with 66% of all the world population living in areas where there are high levels of infection (Park, 2007). There are more than 2 billion people Worldwide, having evidence of recent or past HBV infection and 350 million are chronic carriers.

Approximately 3 million health care workers (HCWs) experience percutaneous exposure to blood borne viruses (BBVs) each year. This results in an estimated 16,000 hepatitis C virus, 66,000 hepatitis B virus, and 200 to 5000 human immunodeficiency virus (HIV) infections annually. More than 90% of these infections are occurring in low-income countries, and most are preventable. Several studies report the risks of occupational BBV infection for HCWs in high-income countries where a range of preventive interventions have been implemented. In contrast, the situation for HCWs in low-income countries is not well documented, and their health and safety remains a neglected issue.

Hepatitis B infection is a serious blood-borne disease, caused by the hepatitis B virus (HBV) which attacks the liver, and although in acute cases rarely results in liver failure and death; the main public health problem is that this can lead to lifelong chronic HBV infection, which may be followed by cirrhosis and/or liver cancer. Chronically infected HBV carriers are able to transmit HBV through contact with their body fluids, which includes occupational exposure to their blood and secretions, sexual intercourse. People at risk include health care workers (HCWs) in contact with blood and human secretions, haemodialysis staff, oncology and chemotherapy nurses, all personnel at risk of needle stick/sharps injuries, which includes those working in operating rooms and clinical laboratories, respiratory therapists, surgeons, doctors, dentists, nurses, as well as medical, dental and nursing students (Smelzer and Bare 2003).

Universal precautions in the health care setting include correct usage and disposal of disposable syringes, needles and lancets, and introduction of needle less intravenous infusion administration systems, disinfecting work areas and wearing of gloves and protective clothes. Standard precautions are a set of infection control practices used to prevent transmission of diseases that can be acquired by contact with blood, body fluids, non-intact skin (including rashes), and mucous membranes. These measures are to be used when providing care to all individuals, whether or not they appear infectious or symptomatic. Infection, particularly hospital-acquired infection, concerned with a significant morbidity and mortality rate because it is the most serious problem not only due to a burden of illness and costs of prolonged admission on the patient, but also it increases the cost of investigation and treatment on the hospital as well as prevents the other patients from using the hospital beds. Hospital acquired infection carries the risk of spread of infection to other patients (Graven & Hirnle, 2007).

## **SIGNIFICANCE OF THE STUDY**

Needle sticks and sharps injuries represent a significant hazard in professional nursing. Researches also have shown that, between all HCWs, nurses are the ones who sustain a high needle sticks injuries burden (Smith et al., 2006). Hsieh et al., (2006) in their researchers found that nurses had the highest percentage (60.6%) of blood borne infections exposures and other job categories including physicians, technicians, cleaning staff, and interns accounted for around 10% each. Injuries occurred most commonly during the daytime (57.0%). Knowledge of health staff about viral hepatitis and its transmission and prevention can stop the spread of this disease in hospitals and in society (Ghahramani et al., 2006 and Kerbleski, 2005). The Society of Gastroenterology Nurses and Associates agree nurses have more contact with patients, and one of the nurse's roles is to provide health education. Accurate hepatitis B virus information helps nurses guide patients and families in understanding this disease process (SGNA, 2003). Also Kerbleski, (2005) added that nurses can convey accurate information to patients with HBV and their families and help decrease transmission to others. The goal of HBV education is to help patients decrease the workload of the liver through a healthy lifestyle and prevent the disease from progressing to cirrhosis or cancer. Nurses with knowledge of HBV resources can effectively refer individuals for

medical evaluation and community support groups. Effective training is essential to ensure that these concepts are understood and put into practice wherever health care is provided. Nursing staff must be educated about basic principles of infection control and acquire new knowledge and skill because the quality of nursing care depends on a large degree on the knowledge, skills, attitudes and activities of the practicing nursing staff (Hassan et al., 2004).

## **METHODOLOGY**

### **Aim of the Study**

The aim of this study was to evaluate the effect of universal precautions Intervention Program on nurses' knowledge and practice regarding hepatitis B virus.

### **Research Design**

A quasi-experimental design was used in carrying out this study.

### **Research Setting**

The study was conducted in Specialized Medical ward (Heamodialysis, medical department, Emergency medical) at Ain Shams University Hospital.

### **Subjects**

The subjects of the present study were selected as a convenience sampling. They consisted of 50 nurses meet inclusion criteria to join the study. The inclusion criteria for nurses were: both sexes ages were from 18 to 50 years. Nurses who didn't receive any related educational program.

### **Tools of Data Collections**

Three tools were used for data collection:

#### **Socio-demographic Questionnaire**

This questionnaire covered the demographic characteristics of nurses such as: age, sex, and level of education, years of experience, place of work.

#### **HBV Knowledge Questionnaire**

This HBV knowledge questionnaire was used to assess nurses' knowledge about hepatitis B virus. It was developed by the researcher based on review of literature (SGNA, 2003; Alter, 2007; Monto, 2002, NIH, 2002; Hoofnagle, 2002; Seefe, 2002 and Terrault, 2002). In this part, the questions are formulated to gather data about the nurses' knowledge, it consisted of 12 items as MCQs, yes or no, score 1 for correct answer, zero for incorrect answer. The total score for this knowledge test was (12) scores.

#### **Observation Checklist about Nurses Practice**

This observation checklist of universal precaution: "the routine use of appropriate barrier and techniques to reduce the likelihood of exposure to blood, other body fluids and tissues that may contain blood borne pathogens in the studied hospitals. Each item was checked by direct observation by the researcher for the following criteria of availability: (always, often, sometimes, seldom, never). A score of 1 was assigned to the answers always and alternative answer take 0 score. The total scores on the 10 practice question ranged from 0-10.

### Ethical Consideration

To carry out the study, the necessary official approval will be obtained from director of hospital. Oral informed consents were secured from each subject to participate after explaining the nature, purpose, and benefits of the study.

### Procedure

1. Approval for data collection was obtained from the Director of Ain Shams University Hospital for conducting the study.
2. The tools were developed by the researcher based on reviewing literature.
3. This tool were tested for its content relevance and language, by 5 experts from medical and nursing staff, the necessary modifications were made.

A pilot study was done on 5 nurses to test clarity and applicability of the tool, and time consuming. The necessary modifications were done to suit the nurses' level.

- i. Data collection for this study was carried out in the period from June 2015 until September 2015. The methods of teaching used in the program were lectures, group discussions, demonstration of health practice, in addition to posters.
- ii. The education intervention will cover 4 hours per weeks (2/days) for each group. The lectures will focus on general knowledge about hepatitis B such as definition, symptoms, risk factor, and prevention, mode of transmission, treatment and care HBV patients. Also information's about universal precautions to prevent blood prone infection.
- iii. Nurses in this study group were selected randomly and given booklet about HBV program. Nurses Knowledge Assessment Sheet filled by researcher for pretest and posttest for study group, to identify nurses knowledge before and after the program for group, within 30-40 minutes.
- iv. Observation checklist for monitoring the nurse skills was filled by the researcher for study group, within 20-30 minutes. The total times needed for monitoring the two activities for each nurse consumed about 70 minutes. The courses carried through 15 hours.

### STATISTICAL ANALYSIS

Data entry and statistical analysis were done using SPSS 18.0 statistical software package. Results were presented as the frequencies, percentage, paired t-test, Pearson correlation analysis to test statistical significance of some variables and to test effectiveness of the programs. Statistical significance was considered at p-value < 0.05.

### RESULTS

**Table 1(Part-I). Socio-demographic characteristics of participants in the study sample**

Variable	Frequency	Percent
<b>Age (years)</b>		
20-30	30	60
31-40	15	30
41-50	5	10
<b>Sex</b>		
Female	50	100

**Table 1(Part-II). Socio-demographic characteristics of participants in the study sample**

Variable	Frequency	Percent
<b>Years of experiences</b>		
< 5	13	26
6- 10	22	44
11-15	11	22
16-20	4	8
<b>Place of work</b>		
Hemodialysis	12	24
Medical ward	20	40
Emergency medical	18	36
<b>Education level</b>		
Diploma (D.N)	38	76
Bachelor ( BNS)	12	24

**Table 2. Frequencies and percentages of correct knowledge regarding HBV and universal precaution pre and post test**

Nurses' knowledge	Pre test		post test		P - value
	No	%	No	%	
<b>Hepatitis B</b>					
What is HBV	30	60	46	92	< 0.01
Function of liver	35	70	50	100	< 0.01
Symptoms of hepatitis B	23	46	35	70	< 0.01
Mode of transmission	45	90	50	100	> 0.05
Risk factor & HBV	37	74	48	96	< 0.01
Treatment & care	39	78	50	100	< 0.05
Vaccination	20	40	48	96	< 0.01
Complication of hepatitis B (on liver, general health)	20	40	45	90	< 0.01
HBV prevention	29	58	45	90	< 0.01
Universal precaution guidelines related to blood and body fluid	35	70	48	96	< 0.01

**Pretest:** before intervention; **post test:** after intervention.

**Table 3. Nurses practices about universal precautions regarding hepatitis B pre and post program implementation**

Items	Pre test		post test		P - value
	No	%	No	%	
Hands should be washed before and after patient care.	30	60	45	90	< 0.01
Hands should be washed before and after using gloves.	40	80	50	100	> 0.05
Hands should be washed after accidental contact with blood, body fluids, secretions, or contaminated items.	45	90	50	100	> 0.29
Wear gloves for vein puncture .	25	50	45	90	< 0.01
Solution used in hand washing.	30	60	45	90	< 0.01
A surgical mask should be worn to protect the nose and mouth when procedures and activities are likely, to generate splashes or sprays of blood or body fluids.	25	50	42	84	< 0.01
Needles should not be bent before disposal.	47	94	50	100	> 0.35
Immediate actions required for sharp injuries.	30	60	50	100	< 0.01
When there is a risk of being contaminated with a patient's blood or body fluids, a gown should be worn.	25	50	40	80	< 0.01
Removing gown and washing hands before leaving patient's environment.	23	46	40	80	< 0.01

**Table 4. Correlations of nurses' knowledge score and some variables in the study group pre and post implementation of program**

Research Variable	Knowledge score	
	Pre	Post
<b>Age</b>		
r- value	0.102	0.229
p- value	0.221	0.011*
<b>Education</b>		
r- value	0.084	0.276
p- value	0.412	0.003*
<b>Years of experiences</b>		
r- value	0.105	0.125
p- value	0.047	0.054
<b>Position of nurses</b>		
r- value	0.239	0.144
p- value	0.047	0.067
<b>Place of work</b>		
r- value	0.139	0.128
p- value	0.240	0.097

\*p <0.05: significant

**Table 5. Correlations of nurses' practice score and some variables in the study group pre and post program implementing**

Research Variable	Knowledge score	
	Pre	Post
<b>Age</b>		
r- value	0.162	0.052
p- value	0.116	0.321
<b>Education</b>		
r- value	0.232	0.461
p- value	0.056	0.004*
<b>Years of experiences</b>		
r- value	0.065	0.025
p- value	0.147	0.029*
<b>Position of nurses</b>		
r- value	0.076	0.274
p- value	0.007	0.093
<b>Place of work</b>		
r- value	0.057	0.058
p- value	0.346	0.345

## DISCUSSION

HBV infection is caused by DNA virus with incubation period of 21-135 days(Sharma and Khajuria,2004). Hepatitis B virus (HBV) infection is an occupational risk for physicians and surgeons especially in developing countries where a carrier rate is about 4%. HBV infection kills about 1.1 million people globally every year (Arnold and Ronald, 1991). However, incidence of HBV infection could be brought down by giving proper education regarding its transmission and immunization of all medical staff with Hepatitis B vaccine. Results of current study were agreement with the result of study done by Satekge, (2010) show that majority of respondents (59.6%) were below 31 years of age .Knowledge regarding preventive measures plays an important role in hepatitis control, as nurse staff knowledgeable about preventive measures can convey their knowledge to the rest of the population which come into contact with them in their day-to-day activities (Mohamed, Wafa, 2011).

In a study conducted by Ayyat et al., (2000) showed that they needed to be educated in washing their hands, avoiding common syringe puncture in order to control hepatitis B and C. The present study showed that knowledge of nurses about hepatitis B and uses of preventive measures was inadequate before educational program and improves after participation in the program. The present study showed that knowledge of nurses about HBV and uses of

preventive measures was inadequate before the educational program, and improved after participation in the program. This agree with (Salih, Abdulla and Zhian, Abdulla, 2014), found that an increase in staff's knowledge about viral hepatitis and their complication with preventive precautions from pretest to post.

This study showed higher statistically significant differences between knowledge about universal precautions related blood and body fluids from pre and post education. This finding is supported of Mukti et al.,(2000) found that there was a significantly different level of knowledge, attitudes and compliance on universal precautions between the control and intervention hospital with  $p=0.0007$ ,  $p=0.038$  and  $p=0.03$ ) respectively following the intervention.

Knowledge regarding preventive measures plays an important role in control of the disease. Therefore, nurses' staff if knowledgeable about preventive measures provides this knowledge to rest of the communities, which come into contact with them in their day-to-day activities. This study showed gap in practice about protective measures for prevention of hepatitis B such as hand washing, wear gloves, surgical mask, and gown and recapping the needless in the pre-education program. This study showed gap in practice about protective measures for prevention of hepatitis B such as hand washing, wear gloves, surgical mask, and gown and recapping the needless in the pre-education program. This agree with Jagger (1998) who found that wearing gloves, gown and avoiding recapping needles was still low in these hospitals, this should become a primary focus for dissemination, since recapping needles is a common cause of puncture injury. Another study conducted in Egypt among health care staff regarding protective measures for prevention of hepatitis report similar kind of findings (Pekesen et al., 2004).

As regards hand washing, the present study revealed that nurses practice low frequency of practice hand washing was observed among nurses in the pre test and improved after participation in program. This may be attributed to inadequate knowledge of the important of hand washing before and after procedure due to high work load, shortage of staffing, and lack of encouragement. Anderson et al., (2008) emphasized that hand washing is the most effective way of preventing the spread of infectious diseases. A study done by Knight and Bosworth, (1998) shows that the good practices were also found among nurses in Australia as they put on gloves when handling blood/ blood equipment, urine and feces. Results of current study were disagreement with the result of study done by Stein et al., (2003) that shows the Australian nurses also wash hands before and after putting on the gloves.

The present study showed that there was a statistically significant correlation between increased knowledge of hepatitis and age, educational level. Similar findings have been reported from Ghahramani et al., (2006) showed that there was a significant relationship between knowledge of hepatitis and age, educational level. There was no significant difference between knowledge of hepatitis and practices and position of nurses, place of work.

This study indicated that there was a significant statistical correlation between years of experience in the hospital and practice among the nurses' staff. These findings are congruent with those of Suchitra and Lakshmi (2007) reported that years of experience in the hospital significantly correlated to increased knowledge, attitudes and practices among the various categories of staff but this did not translate into good clinical practice in the ward.

## REFERENCES

- [1] Alter, M. J. (2007). Epidemiology of hepatitis C virus infection. *World journal gastroenterology*, 13 (17), 2436-2441.
- [2] Anderson, J. L., & Warren, C. A., & Perez. (2008). Gender and ethnic differences in hand hygiene practices among college students. *Am.J Infect Control*, 36 (5), 361-368.
- [3] Arnold, S., & Ronald, J. S. (1991). *Current pediatric diagnosis and treatment* (11<sup>th</sup> Ed.). New Delhi: Lange Medical Books /Mc Graw –Hill.
- [4] Ayyat, A. A., Sayed, H. A., & Abou Had, A. M. (2000). A KAP study among staff and student nurses about infection control in the odor Bioharzm Hospital. *J. Egypt. Soc. Parasitol*, 30, 511-522.
- [5] Ghahramani, F., Mohammadbergi, A., & Mohammad-Salehi, N. (2006). Survey of the students' knowledge about Hepatitis in Shiraz University of Medical Sciences. *Hepatitis Monthly*, 6 (2), 59-62
- [6] Graven, R., & Hirnle, C. (2007). *Fundamentals of nursing, human health and function* (3<sup>rd</sup> Ed.). Wilkins: Lippincott Williams.
- [7] Hassan, K.A., Moftah, M. F., Alaa El din, M. S., & Bayomi, S. S. (2004). Assessment of educational training program for nurses working in maternal and child health centers in Assiut city regarding infection control. *Ass.Univ. Bull. Environ. Res.*, 7 (2), 91-105.
- [8] Hoofnagle, J. H. (2002). Course and outcome of hepatitis C. *Hepatology*, 36, 21-29.
- [9] Hsieh, W. B., Lee, C. M., & Huang, F. Y. (2006). Occupational blood and infectious body fluid exposures in a teaching hospital: A three-year review. *J. Microbiol. Immunol. Infect*, 39 (4), 321-327.
- [10] Jagger, J., Hunt, E.H., Brand-Elnaggar, J., & Pearson, R. D. (1998). Rates of needle-stick injuries caused by various devices in a university hospital. *N. Engl. J. Med.*, 319, 284-8.
- [11] Kerbleski, M., (2005). Hepatitis C: Are You Confused? Issues Related to Patient Education, *GN2*, 13 (36), S20.
- [12] Knight, V. M., & Bosworth N. J. (1998). Perceptions and practices of universal blood and body fluid precautions by registered nurses at a major Sydney teaching hospital. *J Adv Nurs*, 27 (4), 746-751.
- [13] Mohamed, S. A., Wafa, A. M. (2011). The effective of an educational program on nurse's knowledge and practice related to Hepatitis C Virus: A pretest and posttest quasi-experimental design. *Aust J Basic Appl Sci*, 5 (11), 564-70.
- [14] Monto, A. (2002). Steatosis in chronic hepatitis C: Relative contributions of obesity, diabetes mellitus, and alcohol. *Hepatology*, 36 (3), 729-736.
- [15] Mukti, I.A., Treloar, C., Suprawimbarti, I. A., Asdie, I. H. A., & D'Este, K. (2000). Universal precautions ducation intervention for health workers in Sardjito and PKU hospital Indonesia. *Southeast Asian J. Trop. Med.Public Health*, 31 (2), 405-11.
- [16] NIH Consensus Statement on Management of Hepatitis C. (2002). NIH Consensus and State-of-the-science Statements. Retrieved from <https://consensus.nih.gov/2002/2002hepatitisc2002116html.htm>.

- [17] Park, J. E. (2007). *Text book of preventive and social medicine* (19th Ed.). Jabalpur: Banarsidas Bhanot Publishers.
- [18] Pekesen, Y., Canbaz, S., Leblebicioglu, H., Sunbul, M., Esen, S., & Sunter, A. T. (2004). Care physicians' approach to diagnose and treatment of hepatitis C patients. *BMC Gastroenterol*, 4, 3.
- [19] Salih, A., & Zhian, A. (2014). Effect of an educational program on nurses' knowledge and practices toward Hepatitis B virus in emergency hospitals in Erbil City, Erbil, Iraq. *Zanco J. Med. Sci.*, 18 (1), 5-7.
- [20] Satekge, M. M. (2010). *Knowledge, attitudes and practices regarding the prevention of hepatitis B virus infections in final year college student nurses in Gauteng province* (M.Sc. Thesis). Medunsa: School of Public Health, University of Limpopo.
- [21] Seefe, L. (2002). Natural history of chronic hepatitis C. *Hepatology*, 36 (5), 35-45.
- [22] SGNA. (2003): *Gastroenterology nursing: A core curriculum* (3rd Ed.). Chicago: Society of Gastroenterology Nurses and Associates.
- [23] Sharma, R., Sharma, C. L., Khajuria, R. (2004). The knowledge , attitude and practices regarding HBV infection of married women in reproductive age group living in cantonment area, Sunjawan, Jammu . *JK Science*, 6 (3), 127-30.
- [24] Smelzer SC and Bare B., (2003). Brunner and Suddarth's Textbook of medical surgical nursing, 10th edition. Lippincott Williams and Wiking. Philadelphia.
- [25] Smith, D. R., Smith, R. D., Choe, M. A., Jeong, S. J., Jeon, Y. M., Chae, R. Y., & An, G. J. (2006). Epidemiology of needle stick and sharps injuries among professional Korean nurses. *Journal of Professional Nursing*, 22 (6), 359-366.
- [26] Stein, A. D., Makarawo, T. P., Ahmad, M. F. (2003). A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. *J Hosp Infect*, 54 (1), 68-73.
- [27] Suchitra, J.B., & Lakshmi Devi, N. (2007). Impact of education on knowledge, attitudes and practices among various categories of health care workers on nosocomial infections. *Indian Journal of Medical Microbiology*, 25, 181-187.
- [28] Terrault, A. N. (2002). Sexual activity as a risk factor for hepatitis C. *Hepatology*, 36 (5B), 99-105.