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Effect of an educational program on nurses' knowledge and practices toward Hepatitis B virus in emergency hospitals in Erbil City

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Abstract

Background and objective: Nurses have major role in prevention and management of hepatitis B. Aim of the study was to find out the effect of an educational program on nurse' knowledge and practices concerning hepatitis B virus.

Methods: A quasi-experimental study was conducted in emergency hospitals, Erbil city, Iraq from 15th of January to 15th of June 2012 involving 50 nurses. Assessment of the knowledge and practices of nurses was carried out by using a questionnaire developed by the researchers. An educational program was designed, constructed and oriented in order to improve the nurses' knowledge and practices towards hepatitis B virus. Post-test was carried out after the educational program using the same (pre program) questionnaire.

Results: The mean (±SD) score of pre test knowledge was 6.96±1.6, while the mean (±SD) score of post test knowledge was 8.4±1.5 (P<0.001). The educational program has significant effects on nurses' knowledge about main function of liver (P<0.001), complications of renal failure (P=0.002), and avoiding sharing needles and syringes (P=0.013). The post test means (±SD) scores for practices (47±2.46) were significantly higher than the pre-test mean score (43.7±5.16). The educational program had effects on advising practice of hand washing before and after using gloves (P=0.01), using solution for hand washing (P=0.003), risk of contamination with patients' bloods and fluids (P=0.04), removing of gown and washing hands (P=0.012).

Conclusion: The educational program played a significant role in some items which could raise the level of knowledge and practices toward prevention of hepatitis B virus.

Keywords: Hepatitis B, Knowledge, Practices, Educational program.

Introduction

Hepatitis B is a disease caused by the hepatitis B virus (HBV), which is transmitted through per-cutaneous or mucosal exposure to infectious blood or body fluids[1]. It is a major problem because it can cause chronic infection, resulting in cirrhosis of the liver, liver cancer, liver failure, and death. In addition, several extra-hepatic lesions occur because of HBV infection, with this, there is deposition of immune complexes in different organs of the body especially, the kidney[2]. According to the most recent World Health Organization estimate, two billion people worldwide have serologic evidence of past or present HBV infection, and 360 million are chronically infected and at risk for HBV- related liver disease. Approximately one third of all cases of cirrhosis and half of all cases of hepatocellular carcinoma can be attributed to chronic HBV infection. HBV is estimated to be responsible for 500,000 - 700,000 deaths each year[3]. Iraq is a developing country, where HBV and hepatitis C virus (HCV) infections are still prevalent, with an HBV carrier rate of 2%–5%[4]. Health care workers (HCWs) may be exposed to the risk of infection with blood-borne viruses (BBVs) such as HBV, hepatitis C virus (HCV) and human immunodeficiency virus (HIV) via contact with blood (and other body fluids) in the course of their work[5]. Three main strategies are available for the

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prevention of HBV infection: behavior modification to prevent disease transmission, passive immunoprophylaxis, and active immunization. Changes in sexual practices and improved screening measures of blood products have reduced the risk of transfusion-associated hepatitis. Hepatitis B Immune Globulin (HBIG) is a sterile solution of ready-made antibodies against hepatitis B. HBIG is prepared from human blood from selected donors who already have a high level of antibodies to hepatitis B and used in passive immunoprophylaxis. Prevention of primary infection by vaccination is an important strategy to decrease the risk of chronic HBV infection and its subsequent complications[6]. It is important for HCWs to know their HBV status by being screened for the HBV surface antigen (HBsAg) and antibody (anti-HBs), and to be vaccinated against hepatitis B if found to be unprotected. This will protect them from being infected, and prevent them from spreading the virus which can infect patients. The vaccine has been found to be safe and effective, and can protect one for lifetime[7]. 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[8]. Up to researchers' knowledge, no previous study was carried out in Erbil to assess the effect of an educational program on nurses' knowledge and practices regarding hepatitis B. Healthcare professionals have always been encouraged to update their knowledge and maintain clinical competence. The objective of the study was to find out the effect of educational program on nurses' knowledge and practices concerning hepatitis B virus.

Methods

A quasi-experimental study was conducted on 50 nurses out of 300 nurses in emergency hospitals which consisted of Central Emergency Hospital (CEH), Eastern Emergency Hospital (EEH), and Western Emergency Hospital (WEH) in Erbil city. The study started from 15th of January 2012 to 15th of June 2012. Permission for data collection was obtained from Erbil Directorate of Health for conducting the study. Convenience method of sampling was used to collect the study subjects. The inclusion criteria for nurses were: age between 20 to 50 years, and nurses who didn't receive any related educational program. Verbal consent was taken from all nurses before the start of the study. Assessment of knowledge and practices of nurses was carried out by using a questionnaire designed by the researchers. Data were collected through direct interview with the nurses through the use of the mentioned questionnaire which consisted of three parts: Part I was related to socio-demographic characteristics of nurses such as age, gender, years of experience, place of work, and educational level. Part II was related to nurses' knowledge towards HBV; this HBV knowledge questionnaire was used to assess nurses' knowledge and practice about hepatitis B virus. It was developed by the researcher based on review of literature; it involved 10 items which were concerned with issues of the nurses' knowledge towards hepatitis B virus. These issues included definition of hepatitis B, liver functions, hepatitis B symptoms, transmissions of disease; risk factors help to develop disease, complications and universal precautions, prevention, and treatment. The researchers used "Yes" or "No" (Score one was given for correct answer, score zero for incorrect answer) as a measurement score through interview. Part III was about nurses' practices towards HBV, it consisted of 10 items which were concerned with issues of the nurses' practices towards HBV such as 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. The checklist was filled by the researchers during their observation of nurses' practices. An education program was designed, constructed and oriented

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with respect to the nurses' knowledge and practices towards hepatitis B virus. The attendants were involved 15-20 nurses during at rest period from 11:00 a.m. to 01:00 p.m. in hall of each hospital. The program was presented through two sessions that lasts for each two hours. The period between implementation of the program and post test was one week. The content of the program was including the following: hepatitis B overview, hepatitis B transmission and cause, hepatitis B symptoms, hepatitis B, hepatitis B diagnosis, hepatitis B treatment, hepatitis B medications and hepatitis B vaccination. Post-test was carried out after the educational program using the same (pre program) questionnaire Statistical analysis: Data were analyzed using the Statistical Package for Social Sciences (SPSS version 15). McNemar test was used to show effects of an educational program to improve knowledge and practice of nurse toward hepatitis (the test compares proportions before and after the program). Paired t test was used to compare mean scores before and after the application of the educational program. A "P" value of ≤ 0.05 was considered as statistically significant.

Results

Mean (±SD) score of pre test knowledge was 6.96±1.6, while the mean (±SD) score of post test knowledge was 8.4±1.5 (P<0.001). The post test mean scores for practice (47±2.46) was significantly higher than the pre-test mean score (43.7±5.16) (P<0.001). Table 1 shows that more than half (56%) of the sample aged 20-29 years. Females constituted 56% of the studied sample. The table shows that high proportion (58%) of nurses had experience of 1-5 years, and only 4% of the sample had experience of 20-25 years. It is evident in the same table that 60% of the sample was graduates of institutes. Table 2 presents comparisons between the proportions of knowledge about HBV before and after application of the educational program. There were differences between pre and post test percentages of knowledge regarding function of the liver, definition of hepatitis, and complications of the disease (42%, 62%, and 44% on pre test compared to 98%, 86%, and 76% respectively in post test, i.e. after intervention) (P value <0.001, 0.008, and 0.002 respectively). There were also significant improvement in the knowledge about the universal precautions (p = 0.013). Table 3 shows that there were significant differences between pre and post test percentages of practice regarding hand washing before and after using gloves, and solution used in hand washing (62% and 54% respectively on pre test compared to 94% and 80% respectively in the post test, i.e. after intervention) (P value = 0.02 and 0.002 respectively). Table 4 shows the correlation between total knowledge and practice with some variables in the study group pre and post implementation of program. Result present positive statistically significant correlation between pre test of knowledge and practice with age (r=0.350, r=0.291, P value 0.013 and 0.041 respectively). This table also show positive statistically significant correlation between pre test of knowledge and practice with years of experience (r=0.276, r=0.245, P value 0.052 and 0.086 respectively). Same table show positive highly statistically correlation between level of education with knowledge (r=0.421, P value 0.002), while in post test the correlation was not highly significant (r=0.33, P=0.019). The table shows that there was significant positive correlation between level of practice with educational level (r=0.797, P value 0.036) while in post test there was no significant correlation between educational level and practices (r=0.016, P value=0.911).

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Table 1: Distribution of samples by demographic characteristics

	Hospitals			
	CEH* N=20	**EEH** N=15**	**WEH*** N=15**	**Total N=50**
Items	**No. (%)**	**No. (%)**	**No. (%)**	**No. (%)**
Age				
20-29	5(25)	12(80)	11(73.33)	28(56)
30-39	9(45)	2(13.33)	2(13.33)	13(26)
40-49	6(30)	1(6.66)	2(13.33)	9(18)
Gender				
Male	11(55)	5(33.33)	6(40)	22(44)
Female	9(45)	10(66.66)	9(60)	28(56)
Years of Experiences				
1-5	4(20)	13(86.66)	12(80)	29(58)
6-10	5(25)	0(0)	2(13.33)	7(14)
11-15	3(15)	2(13.33)	1(6.66)	7(14)
16-20	6(30)	0(0)	0(0)	6(12)
20-25	2(10)	0(0)	0(0)	2(4)
Educational level				
School of nursing	2(10)	1(6.66)	0(0)	3(6)
Secondary nursing	8(40)	3(20)	0(0)	11(22)
Institutional nursing	8(40)	10(66.66)	12(80)	30(60)
College of nursing	2(10)	1(6.66)	3(20)	6(12)

*CEH: Central Emergency Hospital
**EEH: Eastern Emergency Hospital
***WEH: Western Emergency Hospital

Table 2: Proportions of nurses' knowledge about hepatitis B, before and after the educational program

Items	Pretest N=50 F (%)	Posttest N=50 F (%)	P
Hepatitis B is a viral infection	39(78)	50(100)	NA
Liver secretes bile, stores and filters blood	21(42)	49(98)	<0.001
Hepatitis B symptoms include yellowing discoloration of skin and sclera	31(62)	43(86)	<0.008
Hepatitis B virus is transmitted by contact with the blood or other body fluids	35(70)	43(86)	<0.07
Sharing needles during intravenous drug use is a risk factor	37(76)	38 (76)	1.0
Chronic hepatitis B can be treated with interferon and anti-viral agents	39(78)	42(84)	0.54
Vaccination is very effective against type B hepatitis	38(76)	41(82)	0.607
Hepatitis B infection can cause kidney failure	22(44)	38(76)	0.002
Hepatitis B can be prevented by avoiding sharing needles and syringes with others	39(78)	41(82)	0.8
Universal precautions refer to the practice of avoiding contact with patients' bodily fluids, by gloves, goggles, and face shields	35(70)	46(92)	0.013

Mean (±SD) score of pre test knowledge 6.96±1.6
Mean (±SD) score of posttest knowledge 8.4±1.5

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Table 3: Proportions of nurses correct practices about general precautions regarding hepatitis B virus, before and after the educational program

No	Items	Pretest		Post-test		
		F	%	F	%	p
1.	Hands should be washed before and after patient care.	40	80	41	82	0.08
2.	Hands should be washed before and after using gloves.	31	62	47	94	**0.02**
3.	Hands should be washed after contact with blood and body fluid	36	72	41	82	0.1
4.	Gloves should be worn before venipuncture	29	58	44	88	0.102
5.	Solution should be used for hand washing	27	54	40	80	**0.002**
6.	Mask should be worn to protect the nose and mouth.	31	62	41	82	0.07
7.	Needles should not be bent before disposal.	31	62	42	84	0.09
8.	Immediate actions required for sharp injuries.	30	60	41	82	0.07
9.	When there is a risk of being contaminated with a patient's blood or body fluids, a gown should be worn.	36	72	36	72	0.06
10	Take off gown and washing hands before leaving patient's environment.	33	66	33	66	0.06

Table 4: Correlations of nurses' knowledge score and practice with age, years of experience and educational level

No	Items	Knowledge scores		Practice score	
		Pretest	Post-test	pretest	Post-test
1.	**Age**				
	r-value	0.350*	0.011	0.291*	0.221
	p-value	0.013	0.941	0.041	0.123
2.	**Years of Experience**				
	r-value	0.276	0.123	0.245	0.267
	p-value	0.052	0.394	0.086	0.061
3.	**Educational Level**				
	r-value	0.421**	0.331*	0.797*	0.016
	p-value	0.002	0.019	0.036	0.911

****** Correlation is significant at the 0.01 level. Mean (±SD) score of pre test of practice 47±2.46

***** Correlation is significant at the 0.05 level. Mean (±SD) score of posttest of practice 43.7±5.16

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Discussion

The present study shows that the largest proportion of the study samples were among age group 20-29, and the highest proportion (around 60%) has job experience between one to five years, and only 12% of sample has bachelor degree of nursing. Results of current study were agreement with the result of study done by Satekge show that majority of respondents (59.6%) were below 31 years of age[9]. 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[10]. 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 especially in items related to functions of liver, definition of hepatitis, and complications of HBV. Similarly a quasi-experimental study conducted by Abou Shady in Mansoura, Egypt involved 50 nurses, found that an increase in staff's knowledge about viral hepatitis and their complication with preventive precautions from pretest to post[11]. Regarding hand washing, the present study revealed that nurses practice inadequate frequency of hand washing. Anderson *et al*. emphasized that hand washing is the most effective way of preventing the spread of infectious diseases[12]. A study done by Knight and Bodsworth 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[13]. Results of current study were disagreement with the result of study done by Stein et al. that shows the Australian nurses also wash hands before and after putting on the gloves[14]. This study indicated that there was a positive significant statistical correlation between age and knowledge and practices of nurses' staff pre test (increase knowledge and practice with increase age of nurses). While post test there was no differences statistical correlation between age and both knowledge and practices of nurses this result indicate that the effects of educational program make adjust between nurse knowledge and practice among difference age categories. The Present study also indicated that there was high statistical positive correlation between level of education and knowledge of nurse pre test. While post test there was no positive correlation in the significant level of 0.01%. This study also shows that there was highly positive statistical correlation between educational backgrounds with level of nurse knowledge regarding HBV (increase knowledge with increase educational background). While post test the correlation was not highly significant. Regarding practices result of pre-test indicates that the level of practices significantly increase with the level of education but effects of an educational program make the correlation not significant in post-test. Similar findings have been reported from Ghahramani *et al.* showed that there was a significant relationship between knowledge of hepatitis and age, educational level[15].

Conclusion

The study concludes that if a need based health education program is developed for different levels of nurses, it definitely leads to improvement in the knowledge and practices of nurses regarding hepatitis B virus. The results of this study showed that educational intervention had a positive impact on knowledge and practice of nurses towered hepatitis B virus. To reduce the occupational risk, effort should be focused to establish effective infection control program and training of staff. It is recommended that further research upon hepatitis B virus is needed.

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