

The Effects of an Educational Program on Nurses Knowledge and Practice Related to Hepatitis C Virus: A Pretest and Posttest Quasi-Experimental Design

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Abstract: Blood borne infections (BBIs) are a major disquiet for all healthcare workers (HCWs). Needle stick injuries (NIs) are one of the prospective modes of spread of such infections. The aim of the study was to determine the effect of educational program on nurses' knowledge and practice regarding hepatitis C virus. The study was conducted in Specialized Medical Units at Mansoura 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 C 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 C 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.

Key words: Blood borne pathogens, hepatitis C virus, education program, knowledge, nursing practice, universal basic precaution.

INTRODUCTION

The hepatitis C virus (HCV) is a blood-borne disease that attacks the liver. Many people do not know they are infected because there are no symptoms in the initial stages of the disease. However, hepatitis C can slowly progress to cirrhosis will go on to develop liver failure or other complications of cirrhosis, including liver cancer (Ryan and Ray, 2004) or life threatening esophageal varices and gastric varices. Hepatitis C is a serious infection of the liver caused by the hepatitis C virus, a blood borne pathogen. An estimated 4.1 million Americans have been infected with HCV, of whom 3.2 million are chronically infected. Hepatitis C is becoming a bigger and more dangerous problem than hepatitis B (CDC, 2008).

Transmission of the virus occurs when blood or body fluids from an infected person enter the body of a person who is not infected. HCV is spread through sharing needles when using drugs, through needle sticks or sharps exposures on the job, through blood transfusions, or from an infected mother to her baby during birth. (Lane, 2006). El-Zanaty *et al.*, (2009) added that the most common exposure to HCV infection in Egypt is from formal and informal medical and dental care. For example, injections of all kinds, blood tests or when blood is taken by syringe or by a lancet. A lancet is a small very sharp blade used to stick a finger for example to get blood for testing blood type. There are many procedures and treatments that are percutaneous (means through the skin) or cause bleeding. If the person doing this is not using sterile equipment or materials or may be has not changed their latex gloves, you could be exposed to HCV infection. Therefore, "To avoid HCV infection, people must be aware of HCV and its routes of transmission; however, their ability to translate that knowledge into practice is strongly related to environmental and social factors (Tiftikci *et al.*, 2009).

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 C virus information helps nurses guide patients and families in understanding this disease process (SGNA, 2001).

Also Kerbleski, (2005) added that nurses can convey accurate information to patients with HCV and their families and help decrease transmission to others. The goal of HCV 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 HCV 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).

MATERIALS AND METHODS

Aim of the Study:

The aim of this study was to determine the effect of educational program on nurses' knowledge and practice regarding hepatitis C.

Research Design:

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

Research Setting:

The study was conducted in Specialized Medical ward (Heamodialysis, Burn, Emergency medical) at Mansoura 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 sex, 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:

Sociodemographic Questionnaire:

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

HCV Knowledge Questionnaire:

This HCV knowledge questionnaire was used to assess nurses' knowledge about hepatitis C 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:

- Approval for data collection was obtained from the Director of El-Mansoura University Hospital for conducting the study.
- The tools were developed by the researcher based on reviewing literature.
- 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.
- Data collection for this study was carried out in the period from August. 2009 until November 2009. The methods of teaching used in the program were lectures, group discussions, demonstration of health practice, in addition to posters.
- The education intervention will cover 4 hours per weeks (2/days) for each group. The lectures will focus on general knowledge about hepatitis C such as definition, symptoms, risk factor, prevention, mode of transmission, treatment and care HCV patients. Also information's about universal precautions to prevent blood prone infection.
- Nurses in this study group were selected randomly and given booklet about HCV program. Nurses Knowledge Assessment Sheet filled by researcher for pretest and post test for study group, to identify nurses knowledge before and after the program for group, within 30-40 minutes.
- 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 AND DISCUSSIONS

Table (1) displays basic demographic characteristics of nurses. It shows that (60%) of nurses have age ranged between 20-30 years in the study group. As regard to sex, the entire sample is females. As regards years of experience, this table revealed that (44%) in the study group had experience ranged between 6- 10 years. In relation to educational level (76%) had diploma of nursing, while 24% had bachelor of nursing. Table (2) reveals frequencies and percentages of knowledge regarding HCV and universal precaution pre and post test, there are difference between pre and post test percentage of knowledge as regard to definition of HCV, function of liver, symptoms, risk factors for HCV, vaccination, complication and prevention and universal precaution guidelines (60%, 70%, 46%,74%, 40%, 40%, 58%, and 70% respectively) on pre test compared to (92%, 100%,70%, 92%, 96%, 90%, 90% and 96%) in the post test (after intervention). There is highly significant difference between pre and post test of nurses (p-value <0.01).

Table 1: Socio-demographic characteristics of participants in the study sample.

Variable	Frequency	Percent
Age (years)		
20-30	30	60
31-40	15	30
41-50	5	10
Sex		
Female	50	100
Years of experiences		
< 5	13	26
6- 10	22	44
11-15	11	22
16-20	4	8
Place of work		
Hemodialysis	12	24
Burn	20	40
Emergency medical	18	36
Education level		
Diploma (D.N)	38	76
Bachelor (BNS)	12	24

Table 2: Frequencies and percentages of correct knowledge regarding HCV and universal precaution pre and post test.

Nurses' knowledge	Pre test		Post test		P - value
	No	%	No	%	
Hepatitis C					
What is HCV	30	60	46	92	< 0.01
Function of liver	35	70	50	100	< 0.01
Symptoms of hepatitis C	23	46	35	70	< 0.01
Mode of transmission	45	90	50	100	> 0.05

Risk factor & HCV	37	74	48	92	< 0.01
Treatment & care	39	78	50	100	< 0.05
Vaccination	20	40	48	96	< 0.01
Complication of hepatitis C (on liver, general health)	20	40	45	90	< 0.01
HCV prevention	29	58	45	90	< 0.01
Universal precaution guidelines related to blood and body fluid	35	70%	48	96	< 0.01

Table (3) shows the difference between pre and post test percentage of practice as regard hand washing, wear gloves, solution used in hand washing, surgical mask, needles, wear gown, removing gown and hand washing (60%, 50%, 60%, 50%, 60%, 50% and 46% respectively) on pre test compared to (90%, 90%, 90%, 84%, 100%, 80% and 80% respectively) in the post test (after intervention). There was a significant improvement in nurses performance about different items related to universal precaution from pre and post educational intervention (p-value < 0.01).

Table (4) describes the correlation between total knowledge & some variables in the study group pre and post implementation of program. It points a positive statistically significant correlation between post program knowledge score and age (r = 0.229, p < 0.05). Also, there was positive statistically correlation between knowledge and education (r = 0.276, p < 0.05). This means that educated nurses lead to high scores of knowledge

Table (5) describes the correlation between practice score and some variables in the study group pre and post program implementation. It reveals to positive statistically significant correlation between post program practice and education level (r = 0.461, p < 0.05). Also, there was positive statistically correlation between practice and year of experience (r = 0.025, p < 0.05). While there was no significant statistically differences between practice score and age, position of nurses, and place of work.

Table 3: Nurses practices about universal precautions regarding hepatitis C pre and post program implementation.

Items	Pretest		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

Pretest: before intervention; post test: after intervention.

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
Age		
r- value	0.102	0.229
p- value	0.221	0.011*
Education		
r- value	0.084	0.276
p- value	0.412	0.003*
Years of experiences		
r- value	0.105	0.125
p- value	0.047	0.054
Position of nurses		
r- value	0.239	0.144
p- value	0.047	0.067
Place of work		
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	Practice score	
	Pre	post
Age		
r- value	0.162	0.052

	p- value	0.116	0.321
Education			
	r- value	0.232	0.461
	p- value	0.056	0.004*
Years of experiences			
	r- value	0.065	0.025
	p- value	0.147	0.029*
Position of nurses			
	r- value	0.076	0.274
	p- value	0.007	0.093
Place of work			
	r- value	0.057	0.058
	p- value	0.346	0.345

Discussion:

Hepatitis C virus infection is an emerging health problem worldwide. Awareness about the disease is necessary in prevention and control of disease and particularly among nurses' staff. In a study conducted by Ayyat *et al.*, (2000) on nurses of Theodore Bilharz hospital 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 C and uses of preventive measures was inadequate before educational program and improves after participation in the program. These result consistent with the findings of Calabro *et al.*, (1998) who stated a significant increase in staff's knowledge score about HCV infection control from the pretest to the posttest. Similarly, Abou Shady *et al.*, (2001) in Mansoura, Egypt noticed increase in staff's knowledge about viral hepatitis and their compliance with preventive precautions from pretest to posttest.

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 C 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. Zimakoff *et al.*, (1992) indicated that HCWs perceived factors that deter them practicing hand washing was either due to skin irritation or dryness of the skin, being too busy, inconvenient location of sinks, lack of institutional guidelines, lack of knowledge or experience, lack of a role model and lack of rewards. Anderson *et al.*, (2008) emphasized that hand washing is the most effective way of preventing the spread of infectious diseases.

Also, Nobile *et al.*, (2002) showed a higher positive attitude among nurses towards hand washing protection of health care personnel. Also, 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.

Conclusion and Recommendations:

From the obtained results of this study, it could be concluded that hepatitis C educational program improved knowledge and practice and decrease occupational risk from blood borne infection after implementation of program. This will help in better adherence to barrier protection such as hand washing, use of

gloves and hand disinfection. Thus, it is recommended that continuing education programs are needed to increase awareness of hepatitis C 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.

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