

Effect of Designed Training Program on Nurse's Performance Regarding Care of Patient with Blood Borne Viral Hepatitis at Assiut University Hospital

Islam I. Ragab¹; Magda A. Mohammed²; Ashraf M. Osman³; Mimi M. Mekkawy⁴

¹Adult Nursing Department, Faculty of Nursing, South Valley University- Qina,

²Medical Surgical Nursing, Faculty of Nursing, Ain Shams University,

³Tropical Medicine Gastroenterology Department, Faculty of Medicine, Assiut University, ⁴Assistant Prof of Medical Surgical Nursing, Adult Nursing Department, Faculty of Nursing, Assiut University, Egypt.

bosyforever20@yahoo.com

Abstract: The aim of the present study is to evaluate the effect of designed of training program on nurses' performance regarding care of patient with blood borne viral hepatitis. A study was conducted in tropical medicine and gastroenterology and internal medicine departments at Assiut University Hospital. To accomplish the purpose of this study data were collected from all nurses' (65 nurses) works in tropical medicine and gastroenterology department and internal medicine department. Tools utilize for data collection were structured interview questionnaire sheet, observation checklist sheet and designed nursing training program. The results show that, about half of the nurses had age > 30 years, while the majority of them were females. As regarding level of education, two third of the study group had diploma degree and about half of the study group their experiences were > 3 years. As regard nurse's knowledge about BBVH there was a highly significant difference between four stages (pre, immediately post, after three months and after nine months) implementing of training program. On pre program implementation, 46.16% of nurses were poor in knowledge, on immediate post program implementation 46.15% of nurses were good and 21.5% were very good in knowledge, after 3 months of program implementation 38.64% of nurses were good and 15.38% were very good in knowledge, but after 9 months of program implementation 13.8% of nurses were good and 10.8% were very good in knowledge, and regarding to nurse's practices the results show that the level of practices improved in all procedures pre, immediately post, after 3 months and after 9 months of implementing of nursing training program. Recommendations, further research studies are needed to focus on service educational program for nurses, there must be standardized written nursing care in tropical medicine, gastroenterology and internal medicine department and develop strategies for improving public health knowledge.

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1. Introduction

Hepatitis is inflammation of the liver which may become inflamed after invasion with an infectious microorganism. The most common types of blood borne viral hepatitis (BBVH) are hepatitis B virus (HBV), hepatitis C virus (HCV) and hepatitis D (HDV)⁽¹⁾.

BBVH are among the most important causes of death and chronic liver diseases worldwide. It occurs between people at any age and even can pass from mother to newborn child. The peak rate of infection occurs among males twice that of females in the 30- 39 age group also bulge in 40 - 59 years⁽²⁾.

BBVH divides into major serotypes and into genotypes which affect the disease severity, course, complications, response to treatment and possibly vaccination. Currently 1.25 million Americans are chronically infected with HBV and 2.7 million are chronically infected with HCV. HDV prevalence rates of 10% of Americans⁽³⁾.

In Egypt about 1.8 % of the general population has HBV. While the situation is quite worse it contains the highest prevalence of hepatitis C in the world 16.7 % of

Egyptian about 15 million are infected but HDV genotype I are most prevalent rates 0.5 %⁽⁴⁾.

In Assiut the numbers of patients with HBV and HCV approximately (7788) cases admitted in Tropical Medicine and Gastroenterology department and Internal Medicine department during the period between 2011- 2012⁽⁵⁾.

The common predisposing risk factors for blood borne viral hepatitis include injecting drugs, blood transfusion, and hemodialysis, birth to an active infected mother, suffering a needle-stick accident. Other risk factors that have a slightly increased risk for hepatitis B is having multiple sex partners and intranasal use of cocaine using shared equipment⁽⁶⁾.

A large number of patients with BBVH are a symptomatic. In the minority of patients they are generally mild, nonspecific and rarely lead to a specific diagnosis of hepatitis B, C and D. The clinical manifestations include decreased appetite, fatigue, abdominal pain, jaundice, itching, sleep disturbances, and flu-like symptoms as anorexia, headache, low-grade fever and arthralgia during the acute phase⁽⁷⁾.

Chronic hepatitis B is diagnosed by hepatitis B markers, PCR, and liver biopsy. As laboratory diagnosis of

HCV include ELISA screening test of HCV antibodies, RIBA test to confirm the result, detection of HCV- RNA by PCR, serum transaminase levels, and liver biopsy. Several complications were reported which include liver fibrosis, cirrhosis, liver failure, and liver cancer. Other complications of chronic hepatitis B and C are glomerulonephritis, cryoglobulinemia, hepatic encephalopathy and portal hypertension⁽⁸⁾.

There are several medications licensed for treatment of hepatitis B infection. These include antiviral drugs and the two immune system modulators. In the same time the treatment of chronic hepatitis C has evolved alpha interferon, Peginterferon alfa-2a, and Peginterferon alfa-2b or combination of Peginterferon injected once weekly and ribavirin orally.⁽⁹⁾

Where many nurses work, the risk of cross-infection is high. Preventing is an essential activity for all nurses in their everyday practice. Nurses have an ethical and legal duty to protect themselves against infection within hospitals, cross-infection can be avoidable by means of universal precautions and careful sharps disposal. It is important role of the nurse to be familiar with the various types of hepatitis, methods of assessment, prevention and treatment medically and surgically. In addition, teaching is important part of the patient treatment⁽¹⁰⁾.

The nursing assessment should include clinical features, modes of transmission of, history of injection treatment or blood transfusions, physical examination, diagnostic evaluation and risk factors for complications. Often nursing goals include establishes a working partnership with patients and their families to ensure decisions are made like improving physical status of the patient, providing optimal care, knowledge about management and reducing or preventing risk of complications, prevent of recurrence infection, promoting emotional support for the patient and the family members⁽¹¹⁾.

The patient should have the education and support they need to act as a central resource in their own health promoting depending on home and community-based care like teaching patients self-care to manage HCV and HBV successfully; Moreover about medication that are currently being used to treat HBV and HCV, including side effects also how the patient protect himself and others and how to prevent spread of infection⁽¹²⁾.

Significance of the study

From the clinical experience as a head nurse at Assiut University Hospital, observed that, blood borne viral hepatitis is important because it is easy to transmit, has high morbidity and mortality, prolonged loss time from hospital employment and causes hospital cost. Nurses form the largest group of staff in the hospital and are a crucial part of a health team; in addition they have closed and continuous contact with the patient's (blood and body fluids) as nasal secretions, salivation, vomitus, urine, cerebrospinal fluid and peritoneal fluid.

Also, they are at high risk to accidental puncture from contaminated needles and other sharps. Therefore, uniquely placed to incorporate preventive and promote teaching guidance in the day-to-day care they provider. So, this study will be the first study in this geographical location which will help such group of nurses to improve there knowledge and practices toward care of patients with blood borne viral hepatitis.

Aim of the present study:

To evaluate the effect of designed of training program on nurses' performance regarding care of patient with blood borne viral hepatitis.

Research hypotheses:

To fulfill the aims of the study the following research hypotheses are formulated:-

1. The post mean knowledge scores of the nurses who will receive the nursing training program will be higher than their pre mean knowledge scores.
2. The post mean practice scores of the nurses who will receive the nursing training program will be higher than their pre mean practice scores.
3. The incidence of risk factors as needle stick during caring of patient with blood borne viral hepatitis by nurses after nursing training program implementation will be lesser than that developed pre training program implementation.
4. A positive relationship will exist between knowledge and practice score obtained by nurses receiving the nursing training program.

2. Material and Methods:

Research design:

Quasi-experimental research design has been utilized in this study.

Study variables:

The independent variable in this study was the designed training program while the dependent variables are nurse's knowledge and practices.

Technical Design:

Study setting: The study was conducted in Tropical Medicine and Gastroenterology and Internal Medicine departments at Assiut University Hospital.

Description place of the setting:

Tropical medicine and gastroenterology and internal medicine departments where nurses counselling sessions. It was conditioned, quiet, had lighting, well ventilated and furnished, and had adequate spacing for implementing the counselling session.

Study subjects:

A convenience sample including all available nurses (65) nurses as (10) males and (55) females who are working in tropical medicine and gastroenterology department (40) nurses and (25) nurses at Internal Medicine department all are willing to participate in the study. Their ages ranged between (19- 45) years who are currently assigned and provide care for blood borne viral

hepatitis patients.

Tools of data collection:

Data pertinent to the study were collected and utilized by three tools as the following:

- 1- Structured interview questionnaire sheet for the nurses to assess their knowledge.
- 2- Observation checklist sheet for nurses to assess their skills about blood borne viral hepatitis.
- 3- Designed training program.

Too I: Structured interview questionnaire sheet (Annex I):

It was developed by the researcher after reviewing the relative literatures and translated to arabic simple language to assess exact nurses' knowledge about blood borne viral hepatitis. It was used prior to implementation of the training program. The same tool was used immediately after the implementation of the training program (immediate post-test) in addition to after three months then nine months later to evaluate the gain in knowledge after the intervention. It consists of three parts:

Part (one): includes socio-demographic characteristics for nurses (e.g., age, gender, residence, marital status, educational level, years of experience and previous attended training programs. It includes 9 items.

Part (two): used to assess nurses' knowledge about blood borne viral hepatitis. It includes 47 items:

- Define blood borne viral hepatitis and their clinical forms of it. It includes 23 questions.
- Predisposing factors to transmission of blood borne viral hepatitis, pathogenesis and diagnosis. It includes 13 questions.
- Methods of prevention and treatment of blood borne viral hepatitis. It includes 11 questions.

Part (three): used to assess nurses' knowledge about the difference between hepatitis B and C, initial evaluation of the general condition of patients with blood borne viral hepatitis, nursing care priorities provided to patients, the important nursing notes that recorded, the nursing management for anxiety and stress, nursing planning for discharging and treatment with interferon. It includes 15 questions.

The structured interview questionnaire sheet was filled out by the researcher from the nurses who answered all its components then collected during the interview. The total number of questions was 71.

Scoring system:

Knowledge of the nurses about blood borne viral hepatitis were presented as yes or no question that were developed to assess their knowledge about definition of blood borne viral hepatitis, predisposing factors for transmission of blood borne viral hepatitis, pathogenesis, diagnosis, methods of prevention and treatment of blood borne viral hepatitis. This part included 71 questions, the scoring for each question was judged as the following:

For part II; each complete answer was get score of (2)

and incomplete answer was get score of (1) but unknown answer was get score of (0). Maximal score of (94) would have been obtained for answering correctly all, while a minimal score of (0) would have been otherwise obtained.

For part III; each completely correct answer was get score of (6) and incorrect item was get score of (0). Maximal score of (90) would have been obtained for answering correctly all, while a minimal score of (0) would have been otherwise obtained. Nurses who scored (70%) or more were considered as having "very good" knowledge. Those who scored (60% - 70%) were considered as having "good" knowledge while those scored (50% - 60%) were considered as having "pass" knowledge. less than 50% were considered 'poor'

Tool II: Observation checklist sheet:

These tools were designed by the researcher after reviewing the relevant national and international literatures to observe how the nurses adhere to precautions of infection control. It contains certain items were selected such as; precautions to prevent infection transmission, use universal precautions, nursing duties for the patient's discharge, nurses' roles during parenteral and intramuscular medication, and incident report. In addition, to evaluate the nurses' practice related to prevention and management of blood borne viral hepatitis. This tool was used before and immediately after the implementation of the training program as well as three months and nine months later to evaluate the impact of the training program on nurses' practice. It consists of the following main five rules.

- Precautions to prevent infection transmission from the patient to the nurse and from the nurse to the patient which includes 24 items, as regards: Use the personal protection equipments (PPE), activities to disposing from sharp equipments, activities to disposing from all equipments that infected with the patient's blood and fluids, cleaning and disinfection activities in the hospital and use five rights' activities during giving medications.
- Use universal precautions for safety environment to the patient. It includes 9 items as, regards the rules of infection control.
- Nursing duties for the patient's discharge which includes 9 items as, regards the following: Instructions about mode of transmission of infection, prevention and treatment, proper food and continuing care and following up.
- Nurses' roles during parenteral and intramuscular medication which includes 17 items as, regards the following: Using of the safety injection, making good hand washing and using of equipment of parenteral medication administration
- Incident report which includes one item (n 60).

Scoring system: was rated for four levels: not done gets score of (0) un applicable gets score of (1), un correct gets score of (2) and correct answer gets score of (3). Those who obtained less than (50%) were considered having

unsatisfactory level of practice. More than (50%) were considered having satisfactory level of practice.

Tool III: Designed training program:

The content of designed training program was developed by the researcher based on nurses' needs, current national and international literature review, researcher experience and opinions of the medical and nursing expertise. It based on www.hepaticviruse.com, (2009); National association of gastroenterology, (2010); National association of healthy liver, (2010); American College of Hepatology (2011) and the Egyptian association for viral hepatitis, (2011).

The training program guideline booklet was revised and modified based on the expertise comments. It was written in Arabic using simple language with illustrations and was modified by the investigator. It was concerning knowledge about preif illustration of the liver, identification of different types of blood borne viral hepatitis, mode of transmission, prevention, complications and treatment and concerning basic skills for nurses working with patients who has blood borne viral hepatitis as; precautions to prevent infection transmission, use universal precautions, nursing duties for the patient's discharge, nurses' roles during parenteral and intramuscular medication, and Incident report.

Operational design

Procedure: The study was carried out on three phases

The preparatory phase (1st phase)

Preparation of tools for data collection and program was done during this phase. It was reviewed by a panel of medical – surgical nursing and medical experts. The researcher was designed and tested the tools and training program after extensive literature review (nursing textbooks, journals, internet resources, etc.). To facilitate the implementation of the training program, researcher prepared the training places, teaching aids and media (pictures, videotapes and handouts).

This was followed by arranging for the training program schedule based on the contents of program, number of staff involved, time availability, shifts as well as the resources available.

Content validity:

It was established by panel of seven expertises from the medical and medical-surgical nursing staff who reviewed the instruments for clarity, relevance, comprehensiveness, understanding and easiness for administrative minor modifications were required.

Pilot study:

It was carried out in October 2011, on 10 % nurses working with patients with blood borne viral hepatitis. They were chosen randomly from tropical medicine and gastroenterology and internal medicine departments at Assiut University Hospital to test visibility and applicability of the tools and to estimate the time required for interview. Some minor modifications based on the result of the pilot study were made to have more applicable

tools for data collection. Some statements were omitted, added or rephrased, and then the final forms were developed, so the 10% of the subjects selected for the pilot study were not included in the main study.

Implementation phase: (2nd phase)

Before conducting the actual study, an official permission was obtained and the purpose of the study was explained to all nurses. At initial interview the researcher introduce her self to initiate line of communication, explain the nature and purpose of the teaching protocol and asked nurses to fill out the questionnaire sheet to assess nurse's knowledge before application of the training program. The researcher fill out the observation checklist to assess nurses' performance before application of the training program also she scheduled with the nurses the teaching sessions for both theory and practice and the nurses were divided into small groups or according to their workload, each group contains 10 nurses.

Each group of nurses was given the freedom to choose their optimal time for receiving the teaching program whenever they have minimal workload. It were used before and immediately after the implementation of the training program as well as three months and nine months later to evaluate the impact of the training program on nurses' practice.

Training program sessions:

The training program has been implemented for nurses in terms of sessions and teaching on the spot during their official working hours. Program was aided by using posters and handout about the care of patient with blood borne viral hepatitis. There were a total of six sessions in addition to pre assessment session. These six sessions were repeated 10 times to each group. Four knowledge sessions, based on the nurses needs for knowledge about blood borne viral hepatitis according to gather elements. The duration of each knowledge session was one hour includes 15 minutes for discussion and feedback.

These were followed by two practice sessions, the duration of each practices session was two hour and there is break in between. Each session usually started by a summary of what has been taught during the previous sessions and the objectives of the new topics. Feedback and reinforcement of teaching was performed according to the nurses needs to ensure their understanding. Giving praise and/or recognition to the interested nurses were emphasized for motivation during the teaching program implementation. Each nurse obtained a copy of the teaching program booklet that included all the training contents.

Evaluation phase: (3rd phase)

The last phase of proposed teaching program is the evaluation phase. In which the nurse's knowledge and practice were evaluated immediately by the researcher after program implementation as well as after three months and nine months later.

Administrative Design:

Official permissions to conduct the study were obtained from the directors and the head nurses of tropical medicine and gastroenterology and internal medicine department at Assiut University Hospitals. Meeting with nursing supervisors and physicians were done to explain the objectives, contents of the training program and the methods for application of the training program to gain their cooperation.

Ethical consideration:

Informed consent was obtained from the nurses who are willing to participate in the study after explanation of the nature and purposes of the study. Confidentiality of the subjects was certainly assured and they were given the right to the nurse to withdraw from this study at any time.

Statistical Design:

The collected data were coded then transformed into specially designed form so as to be suitable for entering into IBM compatible computer. All entered data were

verified for any errors using Statistical Packing for Social Sciences (SPSS) version (17) for windows. The following tests for significance were used frequency, percentage, means and standard deviation, correlation coefficient and ANOVA. Using of t-test for comparison of means and to determine significant for numeric variables. A probability level of 0.05 was adopted as a level of significance for testing the research hypothesis. Statistical significance was considered at p -value <0.05 , $p < 0.01$ moderate significant, $p > 0.05$ non significant and $p < 0.001$ highly significant.

3. Results:

Table (1): This table demonstrates that, about half of the nurses had their age > 30 years, while the majority of them were female. As regarding level of education two third of the study nurses was diploma degree and about less than half of the study group their experiences were > 3 years.

Table (1): Frequency distribution of socio-demographic characteristic of the studied nurses (n= 65)

Variables	Frequency	
	No.	%
Age:		
• < 20 years	9	13.85
• $20 - < 30$ years	24	36.92
• > 30 years	32	49.23
Mean \pm S.D	33.60 \pm 8.30	
Gender:		
• Males	10	15.38
• Females	55	84.62
Marital status:		
• Single	24	36.92
• Married	41	63.08
Level of education:		
• Diploma nurse	44	67.69
• Technical Nurse Institute	13	20.0
• Baccalaureate nurse	8	12.31
Years of experience:		
• < 1 years	19	29.23
• $1 - < 3$ years	16	24.62
• > 3 years	30	46.15
Setting:		
• Internal Medicine	16	24.62
• Gastroenterology	36	55.38
• Tropical Medicine	13	20

Table (2): This table revealed that there is highly statistical significant difference between (pre versus immediately post, pre versus after 3 ms, and immediately post versus after 3 ms) $p = < 0.001$. Also there is statistical significant difference between (pre versus after 9 ms and after 3 ms versus after 9 ms) $p = 0.5$.

Table (3): This table illustrated that there was significance statistical difference between four stages as regard knowledge score level pre versus immediately post ($p = 0.000$ $X^2 = 49.2$) versus after 3 months ($p = 0.000$ $X^2 = 45.51$) and versus 9 months after implementing of training program ($p = 0.000$ $X^2 = 36.21$).

Table (2): Comparison of total and subtotal mean score of knowledge obtained by the nurses during four tests question of implementing training program (n=65)

Items	Pre-test	Immediate post	3 months post	9 months post	Comparison				
	Mean+SD	Mean+ SD	Mean+ SD	Mean+ SD	P ₁	P ₂	P ₃	P ₄	P ₅
Definition a types of BBVH	0.85+0.75	2.00+0.00	1.97+0.08	0.98+ 0.081	<0.001***	<0.001***	<0.001***	0.5 *	0.5 *
- Mode of Transmission	0.06+0.44	1.97+0.16	1.17+1.68	0.06+0.94	<0.001***	<0.001***	<0.001***	0.5 *	0.5 *
- Sign, symptoms & diagnosis	0.28+0.53	1.92+0.99	1.82+0.88	0.29+0.63	<0.001***	<0.001***	<0.001***	0.5 *	0.5 *
- Complications	0.99+0.94	1.42+0.50	1.31+0.20	1.00+0.95	<0.001***	<0.001***	<0.001***	0.5 *	0.5 *
-Prevention and treatment	2.20+4.41	7.78+1.25	2.00+0.00	2.00+0.00	<0.001***	<0.001***	<0.001***	0.5 *	0.5 *
- Infection control	1.20+0.60	1.66+0.53	1.42+0.7	1.22+0.40	<0.001***	<0.001***	<0.001***	0.5 *	0.5 *
- Primary care for BBVH	3.33+1.55	15.40+7.51	13.17+5.46	5.33+3.33	<0.001***	<0.001***	<0.001***	0.5 *	0.5 *
Total	10.21+9.33	33.34+18.94	22.76+12.14	10.88+9.73	0.00	0.00	0.00	0.5	0.5

p₁: pre vs. immediately post * Significant p = 0.5 p₂: pre vs. after 3 months *** Highly significant p = 0.001
 p₃: immediately post vs. after 3 months p₄: pre vs. after 9 months p₅: after 3 months vs. after 9 months

Table (3): Frequency distribution of knowledge score level obtained by nurses during four testes question of implementing training program (n=65)

Scores allotted	Poor		Pass		good		Very good	
	No.	%	No.	%	No	%	No	%
Total knowledge								
• Pre- test	30	46.16	20	30.77	10	15.38	5	7.69
• Immediately post	5	7.69	16	24.61	30	46.15	14	21.53
• 3 ms Post- test	12	18.49	18	27.69	25	38.46	10	15.38
• 9 ms Post- test	37	56.9	12	18.5	9	13.8	7	10.8
P- value1 (X² value)	0.000 *(49.2)							
P- value2 (X² value)	0.000 *(45.51)							
P- value3 (X² value)	0.000 *(36.21)							

p 1: pre vs. immediate post * statistical significant difference p 2: pre vs. after 3 months
 p 3: pre vs. after 9 months

Table (4): This table revealed that there is statistical significant difference between (pre versus after 3 ms, pre versus after 9 ms, after 3ms versus after 9 ms) p = 0.5. Also there is moderate statistical significant difference between (pre versus immediately post and immediately post versus after 3 ms) p = < 0.01.

Table (4): Comparison of total mean score of practice items obtained by the nurses during four tests question of implementing training program (n=65).

Items	Pre-test	Immediate post	3 month post	9 months post	Comparison				
	Mean+ SD	Mean+ SD	Mean+ SD	Mean+ SD	P ₁	P ₂	P ₃	P ₄	P ₅
-Universal precautions	29.61+2.52	45.17+4.01	25.51+4.21	30.70+2.73	<0.01**	0.5*	<0.01**	0.5 *	0.5 *
- Incident report	2.00+0.00	3.94+0.23	3.57+0.44	3.58+0.73	<0.01**	0.5*	<0.01**	0.5 *	0.5 *
- Infection control	20.37+1.48	26.45+2.72	19.18+1.59	17.94+0.82	<0.01**	0.5*	<0.01**	0.5 *	0.5 *
- Discharging plane	16.47+1.39	28.88+4.24	18.13+1.92	16.00+0.00	<0.01**	0.5*	<0.01**	0.5 *	0.5 *
Total	68.45+5.39	104.44+11.2	67.39+8.16	67.22+4.28	0.00	0.00	0.00	0.5	0.5

p₁: pre vs. immediately post * Significant p = 0.5 p₂: pre vs. after 3 months ** moderate significant p = 0.001
 P₃: immediately post vs. after 3 months P₄: pre vs. after 9 months p₅: after 3 months vs. after 9 months

Table (5): This table shows that there was a highly significance statistical difference between four stages as regard practice score level pre versus immediately post (p = 0.001 X² = 60.92) versus after 3 months (p = 0.001 X² = 69.14) and versus 9 months after implementing of training program (p = 0.001 X² = 73.63).

Table (6): As regard knowledge this table clarifies that years of experience (1-3yrs and >3yrs) there is a highly

statistical significant relation affected on mode of transmission and (>3yrs) there is a highly statistical significant relation affected on complications. While age (20-30yrs) there is a highly statistical significant relation affected on mode of transmission and (>30yrs) there is a highly statistical significant relation affected on infection control and primary care for BBVH.

Table (7): As regard practice this table clarifies that

level of education (diploma Ns, technical Ns and baccalaureate Ns) there is a highly statistical significant relation affected incident report and (baccalaureate Ns) there is a highly statistical significant relation affected on discharging plane. While age (<20 yrs) there is a

highly statistical significant relation affected on incident report. At the same time years of experience (>3yrs) there is a highly statistical significant relation affected on discharging plane.

Table (5): Frequency distribution of nurse's score levels of practice during four tests question of implementing training program (n= 65)

Nurse's levels of practice	Satisfactory		Unsatisfactory	
	No.	%	No.	%
Total practice				
• Pre- test	15	23.1 %	50	76.9 %
• Immediately Post - test	50	76.9 %	15	23.1 %
• 3months Post- test	45	69.2 %	20	30.8 %
• 9months Post- test	20	30.8%	45	69.2%
P- value1 (X² value)	0.001 **(60.92)			
P - value2 (X² value)	0.001 **(69.14)			
P - value3 (X² value)	0.001 **(73.63)			

P1: pre vs. immediate post * * highly statistical significant difference P 2: pre vs. after 3 months
P 3: pre vs. after 9 months

Table (6): Multivariate regression analysis affecting knowledge (n=65)

Knowledge	Years of experience						Age					
	< 1 year		1-3 years		> 3 years		< 20years		20-30 years		> 30 years	
	R value	P value	R value	P value	R value	P value	R value	P value	R value	P value	R value	P value
-Define types of BBVH	0.746	0.01*	0.33	0.04*	0.31	0.05*	0.27	0.05*	0.27	0.05*	0.31	0.05*
-Mode of Transmission	0.664	0.01*	0.74	0.001**	0.53	0.001**	0.12	0.23ns	0.53	0.001**	0.03	0.39ns
-Sign, Symptoms & diagnosis	0.15	0.26ns	0.25	0.04	0.29	0.05*	0.20	0.21ns	0.33	0.05*	0.15	0.26ns
-Complications	0.039	0.48ns	0.21	0.20ns	0.74	0.001**	0.24	0.23ns	0.24	0.23ns	0.03	0.39ns
-prevention & treatment	0.03	0.39ns	0.23	0.22ns	0.33	0.05*	0.14	0.25ns	0.039	0.48ns	0.15	0.26ns
-Infection control	0.24	0.23ns	0.24	0.23ns	0.35	0.5*	0.14	0.25ns	0.03	0.39ns	0.74	0.001**
Primary care for BBVH	0.21	0.20ns	0.12	0.23ns	0.35	0.5*	0.14	0.25ns	0.03	0.39ns	0.74	0.001**

(ns) Non significant R= <0.25 (ns) Non significant P = < 0.05 *Significant R= > 0.25
* Significant P = > 0.05 ** Highly significant R=> 0.40 ** Highly significant P = > 0.001

Table (7): Multivariate regression analysis affecting practice (n=65)

Practice	Level of Education						Age						Year of experience					
	Diploma Ns.		Technical Ns.		Baccalaureate		<20 years		20--<30years		>30 years		<one year		1-<3years		> 3years	
	R value	P value	R value	P value	R value	P value	R value	P value	R value	P value	R value	P value	R value	P value	R value	P value	R value	P value
-Universal percussion	0.15	0.26 ns	0.26	0.04 *	0.14	0.25 Ns	0.12	0.23 Ns	0.27	0.05 *	0.28	0.05 *	0.14	0.25 ns	0.28	0.05 *	0.30	0.05 *
-Incident report	0.69	0.001 **	0.61	0.001 **	0.94	0.001 **	0.69	0.001 **	0.28	0.05 *	0.28	0.05 *	0.28	0.05 *	2.26	0.04 *	0.28	0.05 *
-Infection control	0.04	0.48 Ns	0.28	0.5 *	0.34	0.05 *	0.14	0.25 ns	0.26	0.04 *	0.04	0.48 ns	0.14	0.25 ns	2.26	0.04 *	0.28	0.05 *
-Discharging plane	0.12	0.23 ns	0.27	0.05 *	0.59	0.001 **	0.15	0.26 ns	0.06	0.04 *	0.30	0.05 *	0.15	0.26 ns	0.30	0.05 *	0.59	0.001 **

(ns) Non significant R= <0.25 (ns) Non significant P = < 0.05 * Significant R= > 0.25
* Significant P = > 0.05 ** Highly significant R=> 0.40 ** Highly significant P = > 0.001

4. Discussion:

Nursing programs are designed to teach new nurses the very latest in health care technology, there are new products coming out each year that the nurses need to understand. Nurses who have been in the field more than a few years may require training to learn how to use the new digital patient files and health care software. In service

training in nursing is seen as a necessary component to help professional nurse to keep up to date on the most recent developments in nursing and to be able to manage the demands of nursing practice Center of Diseases Control, & Yerly S.⁽¹³⁾

Based on the results of the present study as regard socio-demographic characteristics of nurses, about half

of the nurses had their age > 30 years, and the majority of them were female. As regarding level of education two third of the study nurses have diploma degree and less than half of them their experiences were > 3 years. All of nurses have no in-service training courses related to blood borne viral hepatitis diseases.

In the same line with the current study Saker N S⁽¹⁴⁾, mentioned that findings in tropical medicine and gastroenterology department of Alexandria University Hospital, entitled implementing of a health teaching module on the incidence of health problems for patient with liver cirrhosis due to BBVH infection which revealed that about half of nurses were aged from 20-45 years. The majority of nurses were female and nursing diploma, more than half of them have experience more than 6years and all of them have no in service training courses related to liver cirrhosis or complications of BBVH. However the researcher was imagining that there should be a perfect training program designed for a selected group of nurses and other health team member a head of time to prepare team capable of dealing with such group of patients. Kane & Hadler⁽¹⁵⁾ mentioned that a trained nursing staff in tropical medicine and gastroenterology units is central and necessary for adequate reducing risk of transmission and improving safety. It is necessary to prepare nurses to handle such specialized area of care at the postgraduate level by enrolling in a specially or continuing education program.

As well Garner⁽¹⁶⁾ reinforce on the principles that promote success for optimal nursing care for patients with hepatic viral diseases include; a team approach including specialist nursing and high quality of nursing care provided to the patient.

As nursing knowledge regarding BBVH:

In the present study, the results revealed that about half of the nurses had poor level of knowledge before implementing of the training program. This reflects the lack of scientific preparation in these specialized diseases. This might be related to the fact that providing care to the patient with BBVH needs special skills, knowledge and nursing specialty or may be attributed to insufficient courses related to BBVH included in their undergraduate curriculum of nursing education with lack of continuous education and in-service training program.

In this respect, Lynch and Jackson⁽¹⁷⁾ & National Disease Surveillance Center⁽¹⁸⁾, reported that nurses have a very dominant role in clinical monitoring of sign and symptoms, observations of complications, clinical responses to treatment and educating other clinicians regarding the mode of transmission, diagnosis, prevention, essential primary care and standard methods of infection control.

Moreover, Baffoy and Fayard⁽¹⁹⁾ who recommended that the use of standard nursing care provided to the hospitalized patient with liver diseases due to infection with

hepatitis B and C usually improve the liver functions depending on nutrition and medication strategies. This is the responsibility of gastroenterology department and liver care units. Nurses must be able to expand their knowledge of this area through ongoing education, Journal, and seminars. Consequently, teaching programs for nursing staff constitute an important part. These programs are urgently designed to assess nursing staff in developing and enhancing the skills needed to provide high standards of care to their patients.

As well, Gunson⁽²⁰⁾ agreed that those programs are urgently needed to provide up-to-date knowledge and improve nurse's competency and skills. In addition Tokars and Ali⁽²¹⁾ stated that education and training are two components of staff development that occur after an employee's indoctrination. Early staff development emphasized orientation and in-service training.

The results in the present study revealed that, a great improvement in knowledge score levels after implementing of the training program. This improvement might be related to the fact that about half of nurses were > 30 years this age might have good readiness for learning new things, they might have more responsibilities toward the young nurses so more capacity of learning.

These results are in agreement with those of Prochaska and Velicer⁽²²⁾ who noted that nurse's knowledge and practice improved immediately after receiving to the training program. Scores were higher among younger and newly graduated also medial age of staff that has more experience.

Ellis and Hartley⁽²³⁾ mentioned that a systematic program of orientation on-the-job training, specialized training, and regular in-service training shall be developed and implemented for health information employees to create a positive, motivational climate and to enhance employee opportunity for promotion. In addition an active program of quality assurance review focusing on health information practices.

Morse⁽²⁴⁾ added that, will be usefull for the nurses continuing education courses because it helps advance both their knowledge and skills. Continuing education helps that nurses are kept up to date with new knowledge, skills and information.

As nurse's practice regarding care of patient with BBVH:

The present study revealed improvement in the practice score levels obtained by nurses after implementing of the training program in all items. This has been concluded by the presence of significant differences between results of pre-test and immediate post-test. This finding indicated that skills can be easily improved, especially if linked with their relevant scientific base of knowledge.

Batrof and Mansour⁽²⁵⁾ agree with our study and mentioned that, continuing education is required to maintain competence in practice. Education may take the

form of on-the-job training, programs, workshops or conferences that education has a significant impact on the knowledge and competencies of the nurse clinician.

After three months post-test, the present study revealed that the percentages were slightly decreased, this indicated that the improvement in knowledge and practice was slightly decreased three months after implementing of training program. This result might be explained by the fact that, knowledge retention is usually affected by the time. In this study the researcher measure nurses knowledge and practice in different intervals to measure their knowledge retention.

In this regards, Mohamed ⁽²⁶⁾ found a direct relation between memory loss and length of time that lapses after a certain educational event. Also they reported that nurses who had poor levels of knowledge and/or skills before the exposure to a training program underwent a significant improvement after the implementing of the program but this improvement usually decreased by time.

By time after nine months post-test, the present study revealed the percentages were highly reduced as the majority of nurses were having no satisfactory and poor levels in all items of knowledge and practices with baseline mean scores for total knowledge and practice are low nearly as before the training program.

Dudek ⁽²⁷⁾ studied the intention of testing the retention of certain nursing skills and knowledge of registered nurses. There has been an initial improvement after performing the training program, but there has been a significant decrease in retention of knowledge 3, 6, and 9 months later. The findings of his study reflect similar results to previous research works, suggesting that retention of skills and knowledge quickly deteriorates with time if not used or updated regularly. He recommended refresher courses on regular basis.

Moreover Abd-Alla ⁽²⁸⁾ documented that the in service training program has a beneficial effect in improving the nurse's knowledge and skills. They also recommended that educational programs should be organized according to the needs of nurses with continuous evaluation. In this aspect Declan ⁽²⁹⁾ added that, nursing is a scientifically rigorous discipline, which requires the updated information on a regular basis to ensure best possible care provided to patients. Periodic follow up enhances the audience's ability to retain information and improve their skills.

The present study showed a highly significant statistical difference in nurse's practice for incident report as regard total mean scores pre, immediate post, three and nine months post implementing of training program in the three main clinical areas. These mean that the nurses well understood that the most common route of transmission in the clinical area is via needle stick injuries, especially those

involving hollow needles. Therefore it is essential that the nurse acknowledge the risk and exercise caution. When injuries occur, it is also important that they are reported and standardize circumstances examination must done, such reporting procedures would help the process of data collection, analysis and prevention of BBVH infections between healthcare workers.

However, these results agree with the study of O'Neill ⁽³⁰⁾ which entitled as unsafe injections have been responsible for transmission of blood borne viral diseases that need to be implemented to avoid exposure. Adherence to fundamental infection control principles including safe injection practices, appropriate aseptic techniques, and efficient sharp disposing is essential to prevent transmission of blood borne viruses in healthcare settings.

In this aspect Willy ⁽³¹⁾ added that surgery departments, accident and emergency units, obstetrics and gynecology, and orthodontics are a major risk factor for transmission of HBV and HCV infection. Prevention include strict universal precautions, standard procedures where the worker's gloved hands, using of PPE during handling of patient care also reporting is important for effective protection and follow up.

In addition Gerberding ⁽³²⁾ stated that sharp injuries and contamination incidents should be prevented wherever possible by appropriate use and implementation of standard precautions such as good hand hygiene, appropriate use of personal protective equipment and safe handling and disposal of needles and other sharp instruments. Reporting of sharps injuries and contamination incidents as: contact occupational health department, Inform manager, Report via adverse incident reporting system.

As regarding multivariate regression analysis affecting knowledge and practice:

The present study clarifies that age, years of experience of nurses were positively correlated with total knowledge scores through immediate post three and nine months post implementing of the training program. The results of the present study agree with Marquis L and Huston J ⁽³³⁾ who stated that, the best results in the post-test and follow-up test were observed in the studied sample that had experience that experienced nurses possessed highly superior knowledge when compared with novice nurses.

In addition Kramer and schmalenberg ⁽³⁴⁾ stated that educational support is essential for creating a magnetic work, the more experienced staff the less educational and training needs. As well, Medical University of South Carolina ⁽³⁵⁾ stated that, in service education helps the bedside nursing care providers and increase their competence in specific areas of practice. It enhances their skills, knowledge, and attitude in relation to specific aspects of their role in the work setting.

Friese *et al.*, ⁽³⁶⁾ reported that, continuing

education must result in practice change to be effective. Integration of knowledge occurs when information is combined with performance.

The results of the present study are disagree with the results of Endevelt⁽³⁷⁾ which indicated that the younger nurses are more knowledgeable than old ones. This may be due to the program make refreshment in their knowledge and skills which gained over the time.

The present study showed that significant relation was found between level of education and practice regard total practice's scores through all the study periods, this means that registered nurse might have good readiness for learning and practicing new things as well their awareness about the continuing education.

In the same context this result agrees with that of Ahmed and Jalel⁽³⁸⁾ who reported a statistically significant correlation between nurse's performance scores and their level of education. In the same line, Thourani⁽³⁹⁾ mentioned that nursing is a practice-based profession. Therefore clinical experience depending on level of study curriculums in service education this helps the nursing care providers maintenance and increase their competence in specific areas of practice. It enhances their attitude, skills and knowledge, in relation to specific aspects of their role in the work setting.

The present study clarifies that level of education (diploma Ns, technical Ns and baccalaureate Ns) showed a highly statistical significance relation affected incident report and this agree with Flabouris *et al.*,⁽⁴⁰⁾ who stated that, the success of incident reporting improving safety in health-care systems depend on study of the nursing theory during under graduate level. Good teaching at all level of nursing study with forcing the importance of safety precautions will result in staff nurse adherence concept of safety skills in post graduate study.

The present study clarifies that, level of education (baccalaureate Ns) and years of experience (>3yrs) have a highly statistical significance relation affecting the discharging plan, and this agree with Efraimsson⁽⁴¹⁾ who stated that, discharge planning is aspect of the patient care because it ensures that the same quality and frequency of nursing care is provided in order to prevent relapse. The discharge nurse is the connection between the patient and other health care providers in the community.

In the same line, Lees and Holmes⁽⁴²⁾ mentioned that discharge planning is a process, not a single event used to decide what a patient needs for a smooth transition from one level of care to another. Practical nurse should know several things about patient's discharge plan, this need special level of education, awareness, and experiences. Discharge plan must includes: expected date of discharge depending on nursing diagnosis, medications that prescribed at the time of

discharge, transportation needs at the time of discharge (car, cab, wheelchair van, ambulance, bus etc.), medical equipment needs (cane, crutches, walker, wheel-chair, oxygen, hospital bed, etc) home-care needs (visiting nurse, physical therapy, occupational therapy, home health aid, etc.), rehabilitation needs, special foods or diet restrictions, physical activity restrictions and medical follow-up.

Conclusion:

Based on findings of the present study, it can be concluded that;

1. A highly significant differences between nurse's knowledge (pre versus immediately post, pre versus after 3 ms, and immediately post versus 3 ms) $P < 0.001$. Also a highly significant differences between (pre versus after 9 ms and after 3 ms versus after 9ms) $P = 0.5$.
2. A highly significant differences between nurse's practice (pre versus after 3ms, pre versus after 9ms, after 3ms versus after 9ms) $P = 0.5$.
3. A highly significant relation between nurse's knowledge and practice as regarding immediate post and after 3ms while significant relation as regarding pre and after 9ms
4. A highly significant relation as regarding year of experience (1-3y & > 3y) affected on mode of transmission, and (> 3y) was a highly significant relation affected on complications. While age (20-30y) was a highly significant relation affected on mode of transmission and (>30y) was a highly significant relation affected on infection control and primary care for BBVH patient.
5. A highly significant relation as regarding level of education (diploma ns, technical ns & baccalaureate ns) was a highly significant relation affected on incident report and (baccalaureate ns) was a highly significant relation affected on discharging plan. While age (<20y) was a highly significant relation affected on incident report and years of experience (> 3y) was a highly significant relation affected on discharging plan.

Based on results of the present study, the following can be recommended:

I. For patient:

Patient education is not only a verbal activity. Nurses should develop a written information guideline or manual booklet for BBVH diseases and give it to every patient explain how to safely live after BBVH infection and their feed back must be taken into consideration; and involving of patients' family in health education to increase patient's adherence with care plan and regimen.

II. For nurses:

1. There must be standardized written nursing care in tropical medicine, gastroenterology and internal medicine

department. In addition to making of nursing library and net including all deferent nursing sciences.

2. Provide specially nursing training programs to nurses about BBVH care every (3-6 ms) to ensure high quality Knowledge & practice based on national and international standards.

III. In services:

1. Hepatitis C considers a national security problem so the state must declare Egypt as epidemic area and there must be international intervention to resolve this problem.

2. The government must impose free viral hepatitis tests for all residents on a regular basis at least once a year.

IV. For research (future study):

1. Importance of doing separate nursing studies of hepatology and will helpfully lead to more effective and preventive – based strategies for future.

2. Studies should be done for those patients who high risk for hepatic diseases and apply the preventive measures.

3. Replication of the current study on larger probability sample is recommended to achieve generalized ability.

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