

Effectiveness of Instruction Program on Nurses Knowledge about Transmission and prevention of Hepatitis B Virus Infection by Instruments in Operating Room at Wasit Teaching Hospitals

Ahmed Hussein Hilal¹, Juma Jabur A. Redha²

¹MSc Student, University of Baghdad, Collage of Nursing, Department of Adult Nursing Department.

Email: ahmed.hussein1202a@conursing.uobaghdad.edu.iq

² Assist. Professor, Adult Nursing Department, College of Nursing, University of Baghdad
Email: dr.juma@conursing.uobaghdad.edu.iq

Abstract:

Background: Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus (HBV). It is a major global health problem. It can cause chronic liver disease and chronic infection and puts people at high risk of death from cirrhosis of the liver and liver cancer.

Objectives: To assess Nurses Knowledge and determine the effectiveness of instruction program on nurses knowledge about transmission and prevention of hepatitis B virus infection by instruments in operating room.

Methods: A quasi-experimental design participants who are not randomly has conducted in the present study .Data collection has done from at two times : pre- test and post -test and interventions of the program for the study group ,carried out instructional program applied in nurses knowledge about Transmission and Prevention of Hepatitis B Virus Infection by Instruments in Operating Room at Wasit Teaching Hospitals. Non – probability sample (purposive sample) consists of 60 nurses who are working in operating room at Wasit city's hospitals in two teaching hospitals.

Results: The study exhibits that instructional program is **highly effective** on nurses' knowledge regarding transmission and prevention of viral hepatitis B in the operating room as indicated by **high significant** difference in times of pre-test and post-test at **p-value=0.001** respectively among the study group. While among the control group, it show no significant difference in pre-test and post-test time.

Conclusion: The study confirms that the instruction oriented program on nurses study group is significant, and that there were statistical differences between level of education and year of experiences in operating room with knowledge.

Recommendations: Training course is necessary to increase nurses' knowledge toward preventing of HBV in operating room. The nurses should attend more training on infection control because the training can give theoretical background pertaining to prevention of infection.

Keywords: Nurses Knowledge, Transmission, prevention and Hepatitis B Virus Infection.

Introduction

Viral hepatitis is a systemic, viral infection in which necrosis and inflammation of liver cells produce a characteristic cluster of clinical, biochemical, and cellular changes, five definitive types of viral hepatitis have been identified: hepatitis A, B, C, D, and E. Hepatitis A and E are similar in mode of transmission (fecal–oral route), whereas hepatitis B, C, and D share many characteristics. The increasing incidence of viral hepatitis is a public health concern. The disease is important because it is easy to transmit, has high morbidity, and causes prolonged loss of time from school or employment. It is estimated that 60% to 90% of cases of viral hepatitis go unreported. The occurrence of subclinical cases, failure to recognize mild cases, and misdiagnosis are thought to contribute to the underreporting. Although approximately 40% of all persons in the United States have antibodies against hepatitis A virus, many cannot recall an earlier episode or the occurrence of the symptoms of hepatitis. (CDC, 2017).

The hepatitis B virus (HBV) infection takes a heavy toll on lives worldwide. In 2014, the World Health Organization (WHO) estimated that 30% of the world's population, around 2 billion people, have been infected with HBV and around 360 million have developed chronic liver disease. Furthermore, HBV has been identified as the cause of up to 80% of all cases of hepatocellular carcinoma worldwide. Although HBV-related acute hepatitis may be asymptomatic and may resolve spontaneously, it may also lead to chronic lifelong infection. The main danger of HBV is in acquiring the infection early in life as progress of the condition towards severe pathological consequences, e.g. liver cirrhosis, liver failure and hepatocellular carcinoma, in adulthood may reach up to 90% of infected cases. Additionally, mother-to-child transmission results in chronic infection later in life in 90% of infants infected during the perinatal period and in 80–90% of infants infected in the first year of life. The risk of chronic HBV infection declines with age, reaching 30–50% for children infected between 1 and 4 years of age and only 2–5% for adolescents and adults. (Al-Romaihi, et al, 2018).

Methodology:

Design of the Study: A quasi-experimental design study is carried out through the application of pre-test and post-test approach for the study and control groups

Setting of the Study: The present study is carried out in the Al-Zahraa Teaching Hospital and Al-Karama Teaching hospital in Wasit City, Iraq January 16th to February 25th 2021.

Sample of the Study: A purposive (Non-probability) sample of (60) nurses are selected. The sample is divided into two groups; (30) nurses (study group) are exposed to the nursing instructional program and (30) nurses are not exposed to the program, considered as the control group.

Instrument Construction: The researches construct instructional program based on review of literature which consist of 6 sessions related to nature of viral Hepatitis, mode of transmission, methods of control measures during contact with patients and facilities, and to evaluate the impact of instructional program, the researchers has constructed the instrument which consists of two parts:

Part I: The Socio Demographic Characteristics:

The first part of the instrument is consist of (6) items concerned with determination the socio-demographic characteristics of (age, gender, level of education, infection control training, years of experience in nursing, years' experience in the operating room).

Part II: Nurses Knowledge Related to Transmission and Prevention of Hepatitis B in Operating Room:

This part was constructed to assess the Knowledge of Nurses Related to Prevention of Hepatitis B in Operating Room. It consisted of (72) multiple choices questions in (8) domains:

First domain: (9) items related to Knowledge of Nurses related to Hepatitis B virus

Second domain: (5) items related to Nurses knowledge of the strategy for controlling hepatitis B in the operating room.

Third domain: (3) items related to causes for the occurrence of viral hepatitis B inside the operating room

Fourth domain: (8) items related to Prevention measures of viral hepatitis B in the operating room

Fifth domain: (13) items related to disinfection and sterilization in the operating room

Sixth domain: (12) items related to suitable healthy area that must be available in the operating room environment

Seventh domain: (14) items related to Nurses' practices towards a mechanism for controlling viral hepatitis B in the operating room

Eighth domain: (8) items related to Nurses' knowledge of the measures taken to prevent hepatitis B virus infection after needle sticks in the operating room.

Statistical Methods: Data have been analyzed through the use of Statistical Package for Social Science (SPSS). Descriptive Data Analysis (Frequencies, Percentages, Mean of Scores, Standard Deviation) and Inferential Statistical (Pearson Alpha Correlation Coefficient, Paired T-Test) was used to analyze the results of present study.

Results and Discussions:

Discussion of Socio-demographic Characteristics: Table(1)

The analysis of study shows that nurses are with age group of 23-28 year (31 ± 7 years) among study group (46.7%) while among the control group, 47.7% of them are with age group 29-34 year (31 ± 6 years). Regarding gender variable, high percentages were refer to female nurses among both group: study group (70%) and control group (83.3%). This study is consistent with a study conducted by **Adekanle, et al (2015)** this study show the mean age of the participants was 33.8 ± 8.9 years (age range 20–59 years). This study inconsistent with **Khan, et al, (2017)** represented majority (54.1%) were aged between 41 to 50 years with a mean age of 33 ± 0.2 years. Also this study is consistent with a study conducted by **Mursy & Mohamed (2019)** who reported All of the respondents were females with a mean age of 32.9 ± 11.8 years.

The study indicates that 60% of nurses among the study group and 56.7% among control group are graduated from nursing secondary school. The finding of this study agree with study done by **Mohammed and Hassan,(2014)** They reported that most of the study and control groups graduated from the secondary nursing school. The study by **Elsheikh, et al (2016)** show the level of basic education of health workers in White Nile hospitals was significantly associated with the knowledge about HBV transmission and prevention.

The study results shows the year of experience in nursing field is referring to 6-10 year among both group; the study (50%) and control (56.7%) groups. A study by **Mohammed and Hassan,(2014)** noticed 33.3% of study group have ≥ 20 year of experiences, and 40% of control

group have > than 5 years of experience. The finding of this study disagree with that of the study done by **Abdulla & Abdulla (2014)** 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. Also study conducted by **Dhakal, et al (2016)** represent most of the respondents (75%) had working experience of five years and below in operating theatre.

The study show participation in training courses about prevention and transmission of viral hepatitis B, 40% of nurses in the study group are participated while only 20% in the control group is participated. Those who participated were engaged in 1-3 training courses among both group (study=40% and control=20%) .(46.7%) and (53.3%) of the study and control groups trained from 1- 3 courses of training related to infection control respectively. This study consistent with (**Hang Pham, 2019**) shows that nearly half of the participants (45.9%) reported having received training on HBV prevention, diagnosis or management within the last two years. Also study done by **Eltahir, et al, (2012)** represented that only 28.4% of the operating room staff had attended HIV/HBV prevention program. The attendance of the paramedics was 10% however that of the surgical doctors.

Discussion of Overall Assessment of Nurses' Knowledge about Transmission and Prevention of Viral Hepatitis B in Operating Room:Table(2)

The study shows that nurses in the study group are showing fair level of knowledge during the time of pre-test (80%) while their knowledge increased to show good level during the time of post-test and after applying the instructional program (100%). While the nurses in the control group are showing fair level of knowledge during the both time: pre-test and post-test (73.3%). The study about prevention and precautions of hepatitis by **Hassan & Muhbes, (2020)** shows the knowledge of nurses regarding nature transmission of hepatitis, (74%) and (70%) had moderate knowledge. As well as, the knowledge regarding prevention, giving an injection, and treatment hepatitis (59%), (61%), or (41%) them respectively had a high level of knowledge.

The overall represented (69%) nurses had a moderate knowledge towards Prevention and Precautions of Patients with Hepatitis in AL-Diwaniya Teaching Hospital. Another study by **Elsheikh, et al (2016)** show knowledge about HBV transmission and prevention. In the Nigerian study, the good knowledge of health care providers about BBDs precautions had shown the highest frequency among those with working duration more than 5 years. The difference between

this study and the Nigerian one might be due to the poor in service training for health workers in the White Nile hospitals. It could also be to the brain drain of the trained health staff that search for better financial support outside the State.

Discussion for Effectiveness of an Instructional Program on Nurses' Knowledge about Transmission and Prevention of Viral Hepatitis B in Operating Room: Table(3)

This study exhibits that instructional program is highly effective on nurses' knowledge regarding transmission and prevention of viral hepatitis B in the operating room as indicated by high significant difference in times of pre-test and post-test at $p\text{-value}=0.001$ respectively among the study group. While among the control group, it show no significant difference in pre-test and post-test time.

This study consistent with study done by **Wahab & Taha, (2016)** shows Prior the implementation of the educational program, a pre-test was carried out on study and control groups. The study found that there is no significant difference between the two groups regarding HBV. It means that the nurses in both groups had the same knowledge about HBV. After the implementation of the educational program on the study group, post-test was administered for both groups three weeks after the program. Results indicated that there is a highly significant difference in the post-test for study group. This indicates a positive effect and high compliance with the education program, and this means that the education program was effective on improving the nurses' knowledge.

This result agrees with (**Abdulla and Abdulla, 2014**) the 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.

Discussion of Correlation between Nurses' Knowledge with regard to their Qualification in Nursing among Study and Control Group: Table(4)

The study reports that there is significant relationship between nurses' knowledge with regard to their qualification at $p\text{-value}= 0.034$ among the study group. While there is high significant relationship is seen among the control group between nurses' knowledge and their qualification at $p\text{-value}=0.001$. This studyresult is consistent with study done by**Nsekambabaye, (2017)** represented the level of knowledge on aseptic technique was statistically significant ($p=0.031$) with educational qualification of the respondents. Also this result agree with study

formed by Joukar, et al, (2017) represented that a significant difference was found between the nurses' knowledge on HBV concerning the education level ($P=0.001$).

Discussion of Correlation between Nurses' Knowledge with regard to their Years of Experience in Operation Rooms among Study and Control Group: Table(5)

This study reveals that there is significant relationship between nurses' knowledge and their years of experience in operating room at $p\text{-value}=0.020$ among the study group. While there is no significant relationship is seen among the control group between nurses' knowledge and their years of experience in the operating room. The investigation by Labrague, et al, (2012) shows that length of clinical experience attended are not determinants of the knowledge on the principles of sterile technique in operating room.

Conclusion: The study confirms that the instruction oriented program on nurses study group is significant, and that there were statistical differences between level of education and year of experiences in operating room with knowledge.

Recommendations: Training course is necessary to increase nurses' knowledge toward preventing of HBV in operating room. The nurses should attend more training on infection control because the training can give theoretical background pertaining to prevention of infection, this also can make them aware of the importance of implementing preventing technique principles for HBV in operating room.

Table(1): Distribution Socio-demographic Characteristics of study.

Characteristics	Study Group		Control Group		X^2	df	P-value	Sig.
	f	%	f	%				
Age M± SD=	31 ± 7		31 ± 6					
23 – 28 year	14	46.7	12	40	234.37	9	.034	S
29 – 34 year	8	26.7	14	46.7				
35 – 40 year	6	20	1	3.3				
41 ≤ year	1	6.6	3	10				
Gender								
Male	9	30	5	16.7	19.200	2	.258	N.S
Female	21	70	25	83.3				
Qualification in nursing								

Nursing school	0	0	0	0	31.735	16	.408	N.S
Secondary school	18	60	17	56.7				
Nursing institute	9	30	10	33.3				
Nursing college	3	10	3	10				
Postgraduate	0	0	0	0				
Total	30	100	30	100				
Years of experience in nursing								
1 – 5 year	9	30	6	20	248.33	16	.027	S
6 – 10 year	15	50	17	56.7				
11 – 15 year	2	6.7	3	10				
16 – 20 year	3	10	3	10				
21 ≤ year	1	3.3	1	3.3				
Years of experience in operation room								
1 – 5 year	18	60	18	60	166.40	16	.355	N.S
6 – 10 year	9	30	9	30				
11 – 15 year	1	3.3	2	6.7				
16 – 20 year	1	3.3	1	3.3				
21 ≤ year	1	3.3	0	0				
Participation in courses about infection control								
No	18	60	24	80	12.813	2	.686	N.S
Yes	12	40	6	20				
Total sample 30								

f: Frequency, %: Percentage, χ^2 : Chi-square, df: degree of freedom, p: Probability, Sig: Significance, S: Significant, N.S: Not significant

Table (2): Overall Assessment of Nurses' Knowledge about Transmission and Prevention of Viral Hepatitis B in Operating Room

Levels of Knowledge	Study Group (N= 30)							
	Pre-test				Post-test			
	f	%	M.S	SD	f	%	M.S	SD
Poor	5	16.7	32.00	8.208	0	0	62.30	4.815
Fair	24	80			0	0		
Good	1	3.3			30	100		
Total	30	100						
<i>f: Frequency, %: Percentage, M.S: Mean of score, SD Standard deviation Poor= 0-24, Fair= 25 -48, Good= 49-72</i>								
Levels of Knowledge	Control Group (N= 30)							
	Pre-test				Post-test			
	f	%	M.S	SD	f	%	M.S	SD
Poor	6	20	31.07	9.388	6	20	31.33	9.496
Fair	22	73.3			22	73.3		
Good	2	6.7			2	6.7		

Total	30	100			30	100		
f: Frequency, %: Percentage, M.S: Mean of score, SD Standard deviation Poor= 0-24, Fair= 25 -48, Good= 49-72								

Table (3) Effectiveness of an Instructional Program on Nurses' Knowledge about Transmission and Prevention of Viral Hepatitis B in Operating Room

Knowledge	Study Group (N=30)					Control Group (N=30)				
	M.	t	df	P-value	Sig.	M.	t	df	p-value	Sig.
Pre-test	32.00	26.19	29	0.001	H.S	31.07	-.381	29	0.706	N.S
Post-test	62.30					31.23				

M: Mean, t: t-test, df: Degree of freedom, p: Probability,

Sig.: Significance, HS: High Significant, N.S: Not Significant

Table (4): Correlation between Nurses' Knowledge with regard to their Qualification in Nursing among Study and Control Group

Knowledge Qualification	Study Group (N=30)			Control Group (N=30)		
	N	Mean	SD	N	Mean	SD
Nursing school	0	0	0	0	0	0
Secondary school	18	29.67	8.506	17	27.53	8.726
Nursing institute	9	34.33	5.568	10	32.60	4.695
Nursing college	3	39.00	9.539	3	46.00	10.817
Total	30	32.00	8.208	30	31.07	9.388
Correlation	<i>r = 0.388</i>	<i>p-value = 0.034</i>	<i>Sig.= S</i>	<i>r = 0.566</i>	<i>p-value = 0.001</i>	<i>Sig.= H.S</i>

N: Number, SD: Standard deviation

r: Pearson correlation, *p*-value: Probability value, Sig: Significant,

N.S: Not significant, S: Significant, H.S: High significant

Table (5): Correlation between Nurses' Knowledge with regard to their Years of Experience in Operation Rooms among Study and Control Group.

Knowledge Years	Study Group (N=30)			Control Group (N=30)		
	N	Mean	SD	N	Mean	SD

1 -5 years	18	29.61	8.125	18	29.61	8.396
6 – 10 years	9	35.00	8.000	9	33.89	12.036
11 – 15 years	1	32.00	-	2	28.50	6.364
16 – 20 years	1	38.00	-	1	37.00	-
21 ≤ years	1	42.00	-	0	0	0
Total	30	32.00	8.208	30	31.07	9.388
Correlation	r = 0.423	p-value = 0.020	Sig.= S	r = 0.121	p-value = 0.525	Sig.= N.S

N: Number, SD: Standard deviation

r: Pearson correlation, **p-value**: Probability value, **Sig**: Significant,

N.S: Not significant, S: Significant, H.S: High significant

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