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Effect of Infection Control Guideline on Practice of Health Care Workers Caring for Patients with Hepatitis C

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Abstract
Background:*The disease of a major influence is hepatitis C. The serious, advanced, and possibly life-threatening infection is Chronic HCV infection.*
Objectives: *the purpose of this study was to value the outcome of applying infection control instruction on health care workers' practice.*
Design: *quasi-investigationalstudydesignwas done in this study.*
Setting: *The study directed at the Egyptian Liver Institute in Sherbein Dakahlia.*
Sample: *A conveniencesection of 61 health care workers was designated.*
Tools of the study: *Two tools were used to gather the requiredstatistics for this study: Tool I: Health care workerspracticeworksheet. Tool II: Infection control instruction.*
Result: *There was a statistically significantamongtotalpractice and ageingimmediateapplicationstage were (p=.038).*
Conclusion: *There was progress in health care workers' practice in direct and next 3 months of application of infection control instruction.*
Recommendation: *Intermittentstimulatingpreparation courses should be delivered to bring up the health care workers to datepracticeconcerningworldwide infection control protections.*
Keywords: *Infection Control Guideline, Health Care Workers, practice, Hepatitis C*

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I. Introduction

The disease of a major influence is hepatitis C. a small-enveloped virus of the Flaviridae family and genus Hepacivirus, with a single-stranded positive RNA molecule of approximately 9.6 kb defined as the hepatitis C virus (HCV). Only a minority of patients clears the acute infection, following exposure to HCV whereas 80% persist with life-long chronic viremia and that considers the chief difficult. The serious, advanced, and possibly life-threatening infection is Chronic HCV infection [1],[2]**.**

The chief contributor to chronic liver diseases global is hepatitis C virus (HCV) infection, presently distressing 3% of the world's population (170-200 million individuals). Owing to liver complications such as liver cirrhosis, liver failure and hepatocellular carcinoma (HCC), triggering about 350,000- 500,000 losses annually global, thus the dense problem of liver-related illness and death is long-term HCV infection. About 50% of the infected persons do not know their infection, regardless of its stage, in spite of the remarkable illness and death of chronic HCV infection [3].

The most significant common medical health difficult in Egypt is HCV and its long-term following concerns. An Egyptian demographic health study directed in 2008 having reserved a descriptive section of the state, from together urban and rural regions and concluded that 14.7% of the people have been infected, considering this the main occurrence in any people worldwide [4],[5].

The occurrence of HCV in Egypt between 2008 and 2015 declined 30%. There was a decline in the HCV infection seroprevalence in Egypt to 6.3% among the studied people, in 2015. Incidence rates of HCV infection have been valued near 165 000 new infections yearly (at 2.4 per 1000 person-years), as spread of HCV is still continuing [6].

Injection drug usage is the chief threat of the common novel and present infections in maximum states. In addition, other threat that cause infection of HCV comprise unsafe therapeutic injections, blood transfusion from unscreened donors, and other health-care related measures [7]**.**

The chief threat for spread in Egypt historically has comprised the currently old parenteral antischistosomal treatment, mutual or reused needles, unwell disinfected surgical or dental tools, and blood transfusions. Whereas presently, Egypt is still seeing a little novel cases of hepatitis C because of unwell tools disinfection measures used in dental and medical sites and unwell infection control which stay the clue of iatrogenic HCV infections till today [4],[8].

Healthcare staffs are possibly at threat of infection with blood-borne pathogens which can occur through mucocutaneous incident (BBF splash) or a percutaneous injury (needlestick injury, NSI), as they are always possibly unprotected from blood and body fluids (BBF) in the course of their work. Three million HCWs experience percutaneous contact with blood-borne viruses annually. Global, (two million hepatitis B, 900,000 hepatitis C and 300,000 human immunodeficiency virus) [9]**.**

The fact is that "standard precautions" are recommended when delivering the care to all patients, regardless of their presumed infection status. These precautions are the basic level of infection control precautions which are to be used as a level of precautions. It is also recommended that when handling equipment and devices that are contaminated or suspected of contamination, and in situations of contact risk with blood, body fluids, secretions and excretions except sweat, without considering the presence or absence of visible blood and skin with solution of continuity and mucous tissues [10].

II. Aim of the Study

This study aimed to:

Evaluate the effect of implementing infection control guideline on health care workers' practice.

Research hypothesis: there will be improvement in practice of health care workers who deliver care for hepatitis C patients and participate in infection control instruction.

III. Subject and Methods

Design: Quasi-experimental study design was used in this study.

Setting: The study was directed at the Egyptian Liver Institute in Sherbein Dakahlia, Egypt.

Subjects: A suitable section of 61 health care employees(18 doctors, 29 nurses, 14 laboratory technicians)who were accessible while collection was done.

Tools of data collection:

Three tools were used to gather the essential statistics for this study:

- Health care staffs practice worksheet.
- Infection control instruction.

Tool I: Health care staffs practice worksheet:

It was advanced by the investigator to estimate health care workers' practice concerning infection control procedures. It involves (35 items). It comprised infection control preventive measure concerning hand cleaning (15 items), individual defensive equipment (9 items), gloving (8 items), reprocessing of reusable instruments and maneuvers (3 items).

Scoring structure:

The score measure was rated as: done (1) while not done (0). Grading measure of the worksheet was composed whole grade was 37 grades. Total grade was 100%. It was estimated as: Total good practice > 75, satisfied practice 65 – 75, poor practice < 65.

Tool II- Infection control instruction:

Infection control instruction was advanced by the investigator constructed on the view of specialists, the outcome of health care workers' practice, the connected writings and accessible construction instruction.

Stages of the Study:

Three chief stages were used for statistics gathering:-

1- Preparatory stage:

A formal approval was made of the investigation morals commission of the nursing faculty at University of Mansoura to do the study after explanation its aim.

Validity: The tool was advanced by the investigator next revising the significant writings and verified for its power by judges of 5 professionals in the field (3 nursing professors and 2 medicine professors).

Reliability: Reliability test was completed by Cronbach's Alpha and existed in practice portion (alpha= .83). For the aim to establish the clearness and applicability of the tool and to guess the period wanted for checklistto be completed.

Pilot study:was directed on 10 health care staffs they were then left out from the study. The outcomes of the pilot study were as follow: Revising the tool, improving and changing some items and tool was reassembled and finished organized for usage.

2- Operational stage:

Comprised assessment, planning and implementation stage.

Valuationstage:Valuation of health care workers practice:

- The aim of the study was clarified from the studied group.
- Oral agreement was attained.
- Privacy assured to health care workers.
- The investigator measured the studied groups' practice using tool I.
- Every meeting took 30 minutes.

Planning stage:The investigator planned the informative program established on valuation of the studied health careworkers through revising the associated writings.Educational supplies were organized asbooklet, audiovisual supplies and video tape.

Implementation stage:

- Health care staffsseparatedagreeing to their timetable into minorclusters (8-12 contributor/ meeting).
- TheMeeting directed by power point demonstration, argument and audiovisual supplies.
- Argument presented throughout meetings and summery presented at the finale of every meeting.
- Every meeting persisted for 30minutes anddirectedevery week.

3- Evaluation phase:

- Estimation health care workers' practiceresult after instruction by tool I.
- The health careworkers were assessed directly and after three months next the meeting of instruction.
- Data gathering enclosed a time of 9 months (taking place from first of January 2016 to end of September 2016).

IV. Result:

Table (1): indicates that bout two third of the studied health care staff (63.9%) were among 20-25, most of them (80.3%) had 1-5 years of experience and only (37.7%) of thestudied health care staffhad preparation courses concerning infection control.

Table (2): Shows comparing practice pre, immediately post and after 3 months of implementing guideline regarding overall practice score. There was a statistically significant difference between pre, immediate and after 3 months of implementation phases in overall practice ($p<0.001$).

The mean± SD percent score of the studied health care workers' overall practice, in pre implementation phase was (36.63± 15.19) compared to (68.20± 11.97) and (52.22± 12.69) in overall practice in immediate and after 3 months of implementation phases.

Table (3): Represents comparing total practice pre, immediately post and after 3 months of implementing guideline among the studied sample. In pre implementation phase, only minority of the studied health care workers (8.2%) had a satisfied overall practice. In immediate implementation phase, more than one third of the studied health care workers (39.3%) had a satisfied overall practice, while only (19.7) of them had a satisfied overall practice after 3 months of implementation phase.

Table (4): Shows comparing health care workers' total overall practice. Only minority of the studied nurses (6.9%) had a satisfied overall practice in pre implementation phase, while near half of them (48.9%) had a satisfied overall practice and more than one third of them (37.9%) had a good overall practice in immediate implementation phase. Near one quarter of them (20.7%) had a satisfied overall practice after 3 months of implementation phase.

Table (5): Represents relation between socio-demographic data with total overall practice. More than half of the studied female health care workers (60% and 58.3%) in pre, and after 3 months of implementation phases had a satisfied overall practice, while more than half of them (58.8%) had a good overall practice.There was a statistically significant relation between overall practice and age ($p=.038$) in immediate implementation phase.

Table (1): Distribution of the studied sample according to demographic data pre, immediately post and after 3 months of implementing guideline (n=61):

Socio- demographic characteristics items	Total (n= 61)		Physician (n= 18)		Nurse (n= 29)		Technician (n= 14)	
	No	%	No	%	No	%	No	%
Age								
20 – 25years	39	63.9	1	5.6	29	100.0	9	64.3
>25 – 30years	15	24.6	10	55.6	0	0.0	5	35.7
>30 years	7	11.5	7	38.9	0	0.0	0	0.0

Min. – Max.	21.0 – 36.0		25.0 – 36.0		21.0 – 24.0		24.0 – 28.0	
Mean ± SD.	25.28±3.41		29.50±2.79		22.66±0.97		25.29±1.20	
Sex								
Male	25	41.0	14	77.8	4	13.8	7	50.0
Female	36	59.0	4	22.2	25	86.2	7	50.0
Years of experience								
1 – 5	49	80.3	8	44.4	29	100.0	12	85.7
6 – 10	12	19.7	10	55.6	0	0.0	2	14.3
Training courses regarding infection control								
No	38	62.3	14	77.8	10	34.5	14	100.0
Yes	23	37.7	4	22.2	19	65.5	0	0.0

Table (2): Comparing practice pre, immediately post and after 3 months of implementing guideline among the studied group (n=61):

Overall practice score	No. items	Score	Pre (n= 61)	Immediately post (n= 61)	After 3 months (n= 61)	P- value Pre/immediately post	P value Pre/after 3 months
Total score	**35**	**0-35**				<0.001**	<0.001**
Min. – Max.			6.0 – 25.0	12.0 – 30.0	10.0 – 26.0		
Mean ± SD			12.82 ± 5.32	23.87 ± 4.19	18.28 ± 4.44		
Percent score							
Min. – Max.			17.14 – 71.43	34.29 – 85.71	28.57 – 74.29		
Mean ± SD			36.63 ± 15.19	68.20 ± 11.97	52.22 ± 12.69		

p: p-value for Post Hoc Test (LSD) for ANOVA with repeated measures for comparison between pre with each of post and after 3 months of program

*: Statistically significant at $p \leq 0.05$**: Highly statistically significant at $p \leq 0.001$

Table (3): Comparing practice pre, immediately post and after 3 months of implementing guideline regarding total overall practice (n=61):

Overall practice score	Pre (n= 61)		Immediately post (n= 61)		After 3 months (n= 61)		P- value Pre/immediately post	P value Pre/after 3 months
	No	%	No	%	No	%		
Poor	56	91.8	20	32.8	49	80.3	<0.001*	0.035*
Satisfactory	5	8.2	24	39.3	12	19.7		
Good	0	0.0	17	27.9	0	0.0		

p: p-value for Marginal Homogeneity Test for comparison between pre with each of post and after 3 months of program

*: Statistically significant at $p \leq 0.05$

Table (4): Comparing health care workers' total overall practice (n=61):

Overall Practice	Physician (n = 18)		Nurse (n = 29)		Technician (n = 14)		χ^2	^{MC}p
	No.	%	No.	%	No.	%		
Pre								
Poor	15	83.3	27	93.1	14	100.0	2.488	0.242
Satisfactory	3	16.7	2	6.9	0	0.0		
Immediately post								
Poor	11	61.1	4	13.8	5	35.7	12.967*	0.010*
Satisfactory	3	16.7	14	48.3	7	50.0		
Good	4	22.2	11	37.9	2	14.3		
After 3 months								
Poor	15	83.3	23	79.3	11	78.6	0.149	1.000
Satisfactory	3	16.7	6	20.7	3	21.4		

χ^2: Chi square test

MC: Monte Carlo for Chi square test

Table (5): Relation between socio-demographic data with overall practice (n=61):

	Pre (n= 61)				Immediately post (n=61)						After 3 months (n= 61)			
	Poor (n = 56)		Satisfactory (n= 5)		Poor (n = 20)		Satisfactory (n= 24)		Good (n = 17)		Poor (n = 49)		Satisfactory (n= 12)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Age														
20 – 25	37	66.1	2	40.0	8	40.0	20	83.3	11	64.7	33	67.3	6	50.0
>25 – 30	14	25.0	1	20.0	9	45.0	2	8.3	4	23.5	11	22.4	4	33.3
>30	5	8.9	2	40.0	3	15.0	2	8.3	2	11.8	5	10.2	2	16.7
χ^2(^{MC}p)	3.768 (0.133)				9.589* (0.038*)						1.657 (0.497)			
Sex														
Male	23	41.1	2	40.0	11	55.0	7	29.2	7	41.2	20	40.8	5	41.7
Female	33	58.9	3	60.0	9	45.0	17	70.8	10	58.8	29	59.2	7	58.3
χ^2(^{FE}p)	0.002 (1.000)				2.975 (0.250)						0.003 (1.000)			
Years of experience														
1 – 5	46	82.1	3	60.0	14	70.0	22	91.7	13	76.5	41	83.7	8	66.7
6 – 10	10	17.9	2	40.0	6	30.0	2	8.3	4	23.5	8	16.3	4	33.3
χ^2(^{FE}p)	1.424 (0.252)				3.570 (0.168)						1.764 (0.229)			
Qualification														
Diploma	23	41.1	2	40.0	4	20.0	12	50.0	9	52.9	19	38.8	6	50.0
Baccalaureate	26	46.4	2	40.0	11	55.0	11	45.8	6	35.3	24	49.0	4	33.3
Master	7	12.5	1	20.0	5	25.0	1	4.2	2	11.8	6	12.2	2	16.7
χ^2(^{MC}p)	0.740 (0.831)				7.555 (0.103)						1.180 (0.593)			
Training courses regarding infection control														
No	35	62.5	3	60.0	14	70.0	15	62.5	9	52.9	30	61.2	8	66.7
Yes	21	37.5	2	40.0	6	30.0	9	37.5	8	47.1	19	38.8	4	33.3
χ^2(p)	0.012 (^{FE}p= 1.000)				1.139 (0.566)						0.122 (^{FE}p= 1.000)			
Health care group														
Physician	15	26.8	3	60.0	11	55.0	3	12.5	4	23.5	15	30.6	3	25.0
Nurse	27	48.2	2	40.0	4	20.0	14	58.3	11	64.7	23	46.9	6	50.0
Technician	14	25.0	0	0.0	5	25.0	7	29.2	2	11.8	11	22.4	3	25.0
χ^2(^{MC}p)	2.488 (0.239)				12.967* (0.009*)						0.255 (1.000)			
Number of Training courses														
0	35	62.5	3	60.0	14	70.0	15	62.5	9	52.9	30	61.2	8	66.7
1	17	30.4	1	20.0	6	30.0	6	25.0	6	35.3	16	32.7	2	16.7
2	3	5.4	1	20.0	0	0.0	2	8.3	2	11.8	2	4.1	2	16.7
3	1	1.8	0	0.0	0	0.0	1	4.2	0	0.0	1	2.0	0	0.0
χ^2(^{MC}p)	2.120 (1.000)				3.538 (0.991)						4.491 (0.210)			
Needle sticks injury history														
No	42	75.0	3	60.0	13	65.0	19	79.2	13	76.5	35	71.4	10	83.3
Yes	14	25.0	2	40.0	7	35.0	5	20.8	4	23.5	14	28.6	2	16.7
χ^2(p)	0.534 (^{MC}p= 0.599)				1.220 (0.543)						0.706 (^{FE}p= 0.490)			

χ^2: Chi square test
MC: Monte Carlo for Chi square test
FE: Fisher Exact for Chi square test

V. Discussion

Occupationally developed infection transferred from both blood borne pathogens, such as hepatitis C&B and Human Immune Deficiency Virus and respiratory infection are the bigger threat for health care workers (HCWs). Standard protections which are a fixed of commendations intended to avoid or decrease contact with infectious mediators by hospital staff, patients and their visitors, are the greatest active and unassuming method to avoid contamination in the hospital[11],[12].

The main section of practice for all healthcare professionals for their health and moreover to decrease nosocomial infections and therefore increase the patient protection is infection control. So, the current study goalsis estimatingapplying infection control instructionoutcome on health care staffs'practice.

1-The intentionalsectiondemographic features:

Outcome of the currenteducationshowed that most of these intentional sections were nurses and the least number were laboratory technicians. That is can be owing to large numbers of the nursing staff working in hospitals. That is in the same line with the study done by[13]who reported that most of the respondents were nurses and minority of them were laboratory technicians. The same the study done by[12]who reported that

partial of the sample were nurses and lesser of them were laboratory technicians. But in dissimilaritydone by[14]who reported that greatest of the studied sample were doctors. Also study done by[15]who stated that two third of the studied sample were doctors.

In the existing study, only one quarter of the studied participantstated that they had a past history of needle stick injury. Needle stick injury was maximum in doctors as partial of them had a history of needle stick injury. That is can be owing to pressure of effort and deficiency of information of doctorsconcerning sharp discarding. In the similar line with study done by[16]who told that close to half of the studied participants had a needle stick injury earlier and occurrence of injury was elevated in doctors. In dissimilarity with the study completed by[17]and study by[18]who stated that additional than three quarter of the participant have a previous history of needle stick injury.

In my study, additional than one third of the studied group had preparation courses concerning infection control. Extra than three quarter nurses gotten courses of infection control. That is can be owing to work burden that prevent them fromgetting courses. In the similarway study completed by[13]who stated that closeto two third of the studied sample had preparationcourses on blood born infection and universal preventive measure.

2- Healthcare staff'spractice about infection control processes

In the existing study, there was little progress in the studied health care staff's practice concerning standard preventive measure. Greatest number of the studied health care staff had a poor practice concerning standard precaution in pre application of instruction. Whereas post applicationmerelyextra than one quarter of them consumed a good practice and extra than one third of them had a satisfied practice, but in follow up there was deterioration in practice for a second time as merely less than one quarter of them had a satisfied practice. There was greatly statistically significant pre and directly post applicationwhereas $p<0.001$. That is can be owing to high work burden, lack of employment and lack of reinforcement In dissimilarity the study of [19] who revealed that progressconcerningwhole universal preventive measure practice of the studied members after gettinginstructive booklet, wherevermerelyfurther than half of the studied members had acceptable practice pre training and developed to further than three quarters of them.

Concerning hand washing, there was no clearprogress as all of the studied sample had a poor practice in pre application of instruction and post application there was merely a minority of them had a good practice and then deterioration in follow up stage. That is can be owing to great work burden. In dissimilarity the study of [20].There was a progress in the general hand hygiene compliance rate from close to half of them earlier the application to close to two third of them through the last three studytimes ($P < 0.001$). Nursing staff preservedpointedly progress intheir hand washing practice after the application.

In the present study, there was progress in the studied health care staff practice pre and post application of instructionconcerning hand washing after touching patient whereasprogressconcerning hand washing before touching patient was not noticeable. Whereas there was a high progress post applicationconcerning hand washing after body fluid contactthreat, as merely near one third of the studied participant pre application do hand washing later after body fluid contact which enhanced to majority of them post application and three quarter of them continue practice hand hygiene after body fluids contact in follow up stage .This is can be owing to amount of work and carelessness of significance of hand washing before becoming in contact withthe patient. Moreover in the similar line the study of [21] who presentedcontinuity of the studied memberconcerning hand washing before and after patient touchimproved from only minority of them to close to half of them pre and post application, whereas it improvedconsiderably to close to three quarter of them in follow up stage after 6 months.

About gloving steps, there was progress pre and post instructionapplication in all steps of wearing and removing gloves amongst the studied sampleand slightly declined in level of their practice after 3 months of application. This can be owing to perfectfacts which reinforced by images in instruction which clarifytechnique of gloving. In the similar study of [19] who presentedprogress of the studied memberspracticeaboutwearing gloves and removing gloves before and after gettinginstructive booklet.

3- Relationship between socio demographic variables with practice:

In relation to practice and age, there was a statistically significant relationship between practice of the studied sample and their age in post instructionapplicationwhereas ($p=0.038$). In the similarway with study of [22]who stated that there was positive statistically significant correlation betweenpractice and age in preapplicationstage ($P=0.041$).

VI. Conclusion

Agreeingwith the current studyoutcomes, it could be settled that:

There was a progress in health care staff's practice after application of infection control instruction

VII. Recommendation

Based Upon The Findings of The Current Study:

- Offer Intermittentstimulatingpreparation courses in order to keep the health care workers of modernizing knowledge concerninggeneral infection control protections.
- Givingteaching programs for recentlyemployed health care staffs about infection control standard protections and at steadyperiods.
- Unremittinginstructive programs for health care staffsaround hepatitis C to retain them with the latest with hepatitis C virus (HCV) and other blood borne diseases.
- Intermittentexamination for health care staffs should be completed to recognize any job-relatedrisks as HCV to accomplish it primary and to avoidadded infection for both health care staffs and patients.

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References

[1] M.A.Blomé, P.Björkman, V. Molnegren, P. Höglund, and A. Widell, Hepatitis C viremia patterns in incident hepatitis C infection and one year later in 150 prospectively tested persons who inject drugs,*Plos One, 9(5),* 2014,e97022.

[2] A. Gi, A.M. Matos, and C. Luxo, Hepatitis C Treatment: What to Expect in 2017,*ARC Journal of Hepatology and Gastroenterology, 1(1),* 2016, 9-12.

[3] L. Gheorghe, L. Sporea, S. Iacob, R. Şirli, A. Trifan, D. Dobru, M. Diculescu, C. Stanciu, O. Pascu, M. Acalovschi, C. Brisc, C. Cijevschi, C. Gheorghe, Z. Spârchez, I. Rogoveanu,and D. Dumitrascu, Position Paper on Treatment of Hepatitis C in Romania, 2017,*J Gastrointestin Liver Dis., 26 (2),*2017, 171-181.

[4] A. Elgharably, A.I. Gomaa, M.M. Crossey, P.J. Norsworthy, I. Waked, and S.D. Taylor-Robinson, Hepatitis C in Egypt – past, present, and future,*Int J Gen Med., 10,* 2017, 1–6.

[5] A. Kandeel, M. Genedy, S. El-Refai, A.L. Funk, A. Fontanet,and M. Talaat, The prevalence of hepatitis C virus infection in Egypt 2015: implications for future policy on prevention and treatment, *Liver Int., 37(1),* 2017, 45-53.

[6] W. El-Akel, M.H. El-Sayed, M. El Kassas, K. Elsaeed, K. Kabil, M. Shawky A. Hassany, A. Yosry, M.K. Shaker, Y. ElShazly, I. Waked, G. Esmat, andW. Doss, National treatment programme of hepatitis C in Egypt: Hepatitis C virus model of care,*J Viral Hepat, 24(4),* 2017, 262-267.

[7] P. Bruggmann, andJ. Grebely, Prevention, treatment and care of hepatitis C virus infection among people who inject drugs,*Int J Drug Policy, 26 (Suppl 1),* 2015, S22-6.

[8] A. Gomaa, N.A. Elsharkway, M. El Kassas, and I. Waked, Hepatitis C infection in Egypt: prevalence, impact and management strategies, *Hepat Med,9,* 2017, 17–25.

[9] S. Singh, A. K. Malhotra, S.K. Verma, R. Yadav, and S. Gupta, A Study on Prevalence of Practice of Universal Precautions Among Health Care Workers in Medical College, Jhansi (U.P),*International Journal of Interdisciplinary and Multidisciplinary Studies (IJIMS), 2 (9),* 2015, 121-124.

[10] A. Ayed, M. Eqtait, I. Fashafsheh, and G.A. Ali, Knowledge & Compliance of Nursing Staff towards Standard Precautions in the Palestinian Hospitals,*Advances in Life Science and Technology J; 36,* 2015, ISSN 2224-7181.

[11] S.A. Al Yousef, Effect of Nursing Guidelines Regarding Infection Control Measures on Performance of Internship Students in Applied Medical Science College at Hafr Al-Batin,*IOSR Journal of Nursing and Health Science (IOSR-JNHS), 3(Issue 4),* 2014, 37-46.

[12] D. Ogoina, K. Pondei, B. Adetunji, G. Chima, C. Isichei, and S. Gidado, Knowledge, attitude and practice of standard precautions of infection control by hospital workers in two tertiary hospitals in Nigeria,*Journal of Infection Prevention, 16(1),* 2015, 16– 22.

[13] M. Zhang, H. Wang, J. Miao, X. Du, T. Li, and Z. Wu, Occupational Exposure to Blood and Body Fluids Among Health Care Workers in a General Hospital, China,*American Journal of Industrial Medicine, 52,* 2009, 89–98.

[14] K. Siddique, S. Mirza, S.F. Tauqir, I. Anwar, A.F. Malik, Knowledge Attitude and Practices Regarding Needle Stick Injuries amongst Healthcare Providers, *Pakistan journal of surgery, 24(Issue4),*2008, 243-248.

[15] T.M. Foster, M.G. Lee, C.D. McGaw, and M.A. Frankson, Knowledge and Practice of Occupational Infection Control among Healthcare Workers in Jamaica, *West Indian Med J, 59 (2),*2010, 147-152.

[16] A. Zafar, N. Aslam, , N. Nasir, R. Meraj and V. Mehraj, Knowledge, attitude and practices of health care workers regarding needle stick injuries at a tertiary care hospital in Pakistan,*J Pak Med Assoc., 58(2),* 2008, 57-60.

[17] S. Muralidhar, P.K. Singh, and R.K. Jain, Needle stick injuries among health care workers in a tertiary care hospital of India, *Indian J Med Res, 131,* 2010, 405-410.

[18] A. Sultana, A. Kulsoom, andR. Iqbal, Needle Stick/Sharp Injuries in Health Care Workers, *Journal of Rawalpindi Medical College (JRMC), 18(1),* 2014, 133-135.

[19] E.R. Ahmad, M. Khamis, E.M. Younis,and S.A. Alrady, Effect of a Developed Educational Booklet about Standard Infection Control Precautions on Nurses' Knowledge and Practices at Woman's Health Center-Assiut University Hospital, Egypt,*Med. J. Cairo Univ., 80(1),* 2012, 435-445.

[20] M.L.McLaws, A.C. Pantle, K.R.Fitzpatrick and C.F.Hughes,Improvements in hand hygiene across New South Wales public hospitals: clean hands save lives, part III., *Med J Aust.; 191(8 Suppl),* 2009,S18-24.

[21] H. Nour-Eldein and N.A. Eldahshan,The Effectiveness of Hand Hygiene Education Intervention for Medical Students in Primary Care Settings, Ismailia City, Egypt. Middle East Journal of Family Medicine, *13(Issue 2), 2015,* 32-40.

[22] S.A. Abdulla, and Z. Abdulla, Effect of an educational program on nurses' knowledge and practices toward Hepatitis B virus in emergency hospitals in Erbil City, *Zanco J. Med. Sci., 18(1),* 2014, 618-624.

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