Nurses' knowledge and Compliance with Universal Precautions in Hilla Teaching Hospitals

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الخلاصـــة:

الهدف: تقييم معارف والتزام الممرضين بالاحتياطات الشاملة في المستشفيات وعلاقتها ببعض الصفات الاجتماعية والسكانية.

المنهجية: تمّ اختيار عينة مناسبة تشمل (100) ممرض وممرضة من العاملين في المستشفيات التعليمية في الحلة (مستشفى مرجان ومستشفى الحلة التعليمي ومستشفى بابل للولادة والأطفال). جمعت البيات للمدة من الأول من نيسان حتى نهاية أيار2008. جمعت البيانات عن طريق المقابلة باستخدام استبانه مبنية بالاعتماد على الأدلة الموصى بها من قبل مراكز السيطرة والوقاية من الأمراض مكوّنة من (22) فقرة. حقق الباحث الثبات والصدق عليها من خلال الدراسة الاستطلاعية وآراء 4 من الخبراء. استعمل الباحث الإحصاء الوصفي والاستنتاجي في تحليل البيانات من خلال التكرارات والنسب المئوية وقيم مربع كاي.

النتائج: أشارت نتائج الدراسة إلى أن معارف والتزام الممرضين بالاحتياطات الشاملة غير مقبولة وأنّ هناك علاقة ذات دلالة إحصائية بين معارفهم والتزامهم وبعض الصفات الاجتماعية والسكانية.

التوصيات: أوصت الدراسة بتصميم وبناء وتنفيذ برامج تثقيفية للممرضين تتعلق بالاحتياطات الشاملة، إضافة إلى إجراء بحوث أخرى على عينه أكبر وعلى نطاق القطر.

Abstract:

Objective: To assess nurses' knowledge and compliance with universal precautions and their relationship with some sociodemographic characteristics.

Methodology: A convenience sample of (100) nurses (males and females) were working in Hilla Teaching Hospitals (Merjan, Hilla, and Babylon Maternity and Paediatrics Hospital) were selected. Data were collected for the period of March 1st until the end of April 2008 through nurses' interview by using a constructed questionnaire based on the universal precautions (UPs) guidelines recommended by the centres for diseases control and prevention (CDC) that contains (22) items. Reliability and validity of the tool were determined through a pilot study and a panel of 4 experts. Descriptive and inferential statistical approaches were used for data analysis.

Results: The study indicated that nurses' knowledge and compliance with UPs were unacceptable and there is a significant relationship between nurses' knowledge and compliance with UPs and some sociodemographic characteristics.

Recommendations: The study recommended that an education program can be designed, constructed and implemented to the nurses related to UPs as well as further and nationwide studies can be conducted on a large sample size of nurses.

Keywords: knowledge, compliance, universal precautions, nurses.

Introduction:

Universal precautions (UPs) as defined by the centre for disease control and prevention (CDC) are a set of precautions that health care workers (HCWs) should follow to prevent transmission of bloodborne pathogens when providing health care [(1)]. They are designed to prevent healthcare staff being exposed to blood and body fluids by applying the basic principles of infection control through hand washing; utilization of appropriate protective barriers such as gloves, mask, gown, and eyewear; and safe handling of needles [(2)].

HCWs are at risk of occupational hazards as they perform their clinical activities in the healthcare facilities. They are exposed to bloodborne pathogens, such as HIV, hepatitis B and hepatitis C, from sharps injuries and contacts with deep body fluids [(3)].

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The world health organization (WHO) estimated that 2.5% of HIV cases and 40% of hepatitis B and C cases among HCWs worldwide are the result of these exposures [4]. To prevent transmission of such pathogens, HCWs must adhere to UPs and follow fundamental infection control principles that including safe injection practices, using of protective barriers, and appropriate aseptic technique [5].

Therapeutic injections, which are commonly overused and administered in an unsafe manner in developing countries, are estimated to account for more than 21 millions new hepatitis B virus infections and approximately 2 million new hepatitis C virus infection each year worldwide [6]. These outbreaks have risen because of HCWs do not consistently adhere to UPs.

Data from a study in Sweden [7] showed that the majority of reported cases of occupational blood exposure was among nurses. Other data [8] revealed that nurses are the staff most frequently involved in occupationally acquired HIV infection.

Little is known about the nurses' knowledge and compliance with UPs in Iraq has urged the researchers to conduct the study in this field. This work will help to assess the nurses' perception about this topic and thus guide the design and implementation of training programs for nursing staff.

Methodology:

A descriptive study was conducted through March 1st until the end of April 2008. A convenience sample of 100 nurses who accepted to participate in the study was selected. Nurses were working in Hilla Teaching Hospitals (Merjan, Hilla, and Babylon Maternity and Paediatrics Hospital). A self-administered questionnaire based on the UPs guidelines recommended by the CDC [9] was used for data collection consisting of 3 parts. Part 1 collected sociodemographic characteristics including gender, age, level of education and years of experience. Part II (10 items) is concerned with knowledge about universal precautions. Part III investigated the sample compliance with UPs in (8) questions. The last 2 parts were scaled as (True/False) and (Agree/Disagree), respectively [2, 10].

A panel of 4 experts have reviewed the tool for its content validity. The reliability coefficient for the questionnaire was 0.82. A descriptive statistical approach (frequencies and percentages) and inferential statistical approach (Chi-square) were used for data analysis.

Results:

Table 1. Sociodemographic characteristics of the sample

Gender	F.	%
Male	62	62
Female	38	38
Total	100	100
Age(years)	F.	%
21-30	35	35
31-40	43	43
≥ 41	22	22
Total	100	100
Level of education	F.	%
Nursing College Graduate	12	12
Technical Medical Institute Graduate	56	56
Secondary School of Nursing Graduate	32	32
Total	100	100

Table 1. (continued)

Years of experience	F.	%
<1	8	8
1-3	12	12
4-6	25	25
7-9	33	33
≥10	22	22
Total	100	100

F= frequency, %= percentage

Relative to nurses' gender, age, level of education, and years of experience, the findings indicated that the highest proportion of the sample was male (62%), 43% has 31-40 years old, technical medical institute graduates (56%), having 7-9 years of experience (33%), respectively (Table 1).

Table 2. Distribution of the sample knowledge by frequencies and percentages

No.	Knowledge	True		False	
		F.	%	F.	%
1.	UPs are applied to patients with HIV and HBV only.(False)	63	63	37	37
2.	UPs are not necessary in situations that may lead to contact with saliva.(True)	53	53	47	47
3.	Isolation is necessary for patients with bloodborne infection.(False)	58	58	42	42
4.	Used needles can be recapped after giving an injection.(False)	72	72	28	28
5.	Subcutaneous injuries during I.V injection are the most common cause of occupational infections.(True)	38	38	62	62
6.	UPs should be applied to all patients regardless of their infection status.(True)	59	59	41	41
7.	HCWs with non-intact skin should not be involved in direct patient care until the condition resolved.(True)	45	45	55	55
8.	Blood spills should be cleaned up with sodium hypochlorite.(True)	59	59	41	41
9.	There is effective anti-HCV and anti-HIV vaccines.(False)	34	34	66	66
10.	For decontamination of devices such as manometer(with only contact with the skin) washing with usual detergent is enough.(True)	60	60	40	40

F=frequency, HCV=hepatitis C virus, HIV=human immunodeficiency virus, %=percentage

This table shows that the highest proportion of the nurses (72%) incorrectly answered that used needles can be recapped. Sixty three percent answered incorrectly the item that Ups are applied to patients with HIV and HBV only. Sixty six percent correctly answered that there is no effective anti-HCV and anti-HIV vaccines. Sixty two percent incorrectly reported the question that subcutaneous injuries are the most common cause of occupational infections.

Table 3. Distribution of the sample compliance with UPs by frequencies and percentages

No.	Compliance	Agree		Disagree	
		F.	%	F.	%
1.	I perform hand hygiene before and after contact with a patient.(T)	23	23	77	77
2.	I wear gloves if contact with blood or body fluids is possible.(T)	44	44	56	56
3.	I wear mask, gown, and eye wear if patient care activities are likely to cause blood and deep body fluids splashing.(T)	53	53	47	47
4.	I apply UPs in situations that may lead to contact with sweat.(F)	43	43	57	57
5.	I dispose needles and other sharp objects in a puncture-proof container.(T)	92	92	8	8
6.	Washing with soap and water for 5 minutes is my first step after contact with infective materials.(T)	65	65	35	35
7.	I suppose that blood and all body fluids of patients are infectious.(T)	51	51	49	49
8.	Autoclaves reusable instruments or disinfects after washing by water and detergent.(T)	79	79	21	21

F=frequency, %=percentage

Table 3 depicted that the highest proportion of the subjects (92%) dispose needles and other sharp objects in a puncture-proof container, (79%) agree that reusable instrument must be autoclaved or disinfected. Seventy seven percent not performing hand hygiene. Only 44% of the sample wears gloves when they contact with blood or body fluids.

Table 4. The relationship between sample knowledge and their level of education

Knowledge / Level of Education	True		False	
	F.	%	F.	%
Nursing College Graduate	80	44.7	99	55.3
Technical Medical Institute Graduate	320	60.4	210	39.6
Secondary School of Nursing Graduate	141	48.5	150	51.5
Obs.χ^2 = 18.7; Crt. χ^2 = 5.99; Df =2; P≤ 0.05				

F=frequency, DF=degree of freedom, crt. χ^2= critical chi-square, obs. χ^2= observed chi-square, P=probability level, %=percentage

Findings revealed that a significant association between sample knowledge and their educational level as indicated in this table.

Table 5. The relationship between sample knowledge and their years of experience

Knowledge / Years of Experience	True		False	
	F.	%	F.	%
< 1	43	41.3	61	58.7
1-3	84	52.5	76	47.5
4-6	132	58.9	92	41.1
7-9	172	57.3	128	42.7
≥ 10	110	51.8	102	48.2
Obs. χ^2 = 12.9; Crt. χ^2 = 9.48; Df =4; P≤ 0.05				

DF=degree of freedom, crt. χ^2= critical chi-square, obs. χ^2= observed chi-square, P=probability level

Table (5) depicted that there is a significant association between sample knowledge

and their years of experience.

Table 6. The relationship between sample compliance with UPs and their level of education

Compliance / Level of Education	Agree		Disagree	
	F.	%	F.	%
Nursing College Graduate	76	55.5	61	44.5
Technical Medical Institute Graduate	198	51.3	188	48.7
Secondary School of Nursing Graduate	170	61.4	107	38.6
Obs. $\chi^2 = 6.87$; Crt. $\chi^2 = 5.99$; Df =2; P≤ 0.05				

DF=degree of freedom, crt. χ^2 = critical chi-square, obs. χ^2 = observed chi-square, P=probability level

There is a significant association between sample compliance with UPs and their level of education showed in this table.

Table 7. The relationship between sample compliance with UPs and their years of experience

Compliance / Years of experience	Agree		Disagree	
	F.	%	F.	%
< 1	61	60.4	40	39.6
1-3	81	59.5	55	40.5
4-6	97	61.8	60	38.2
7-9	113	48.5	120	51.5
≥ 10	92	53.2	81	46.8
Obs. $\chi^2 = 10.5$; Crt. $\chi^2 = 9.48$; Df =4; P≤ 0.05				

DF=degree of freedom, crt. χ^2 = critical chi-square, obs. χ^2 = observed chi-square, P=probability level

Findings of this table illustrated that there is a significant association between sample compliance with UPs and their years of experience.

Discussion:

Unfortunately, the highest proportion of the nurses (72%) answered that used needles can be recapped (table 2). This finding is consistent with a study conducted in Nigeria indicated that 59.7% of 154 nurses do not know that used needles cannot be recapped [11]. Other researchers found that nurses still recapped used needles [12, 13].

Findings indicated that 63% of the subjects incorrectly answered to question that UPs are applied to patients with HIV and HBV only (table 2). A study in Thailand consistent with this result showed that only 27.9% of nurses knew that they would take precautions with all patients [14].Only 66% of the respondents correctly answered that there is no effective anti-HCV and anti-HIV vaccines (table 2). There is no immunization for HIV and hepatitis C [11].

Table 2 showed that 62% of the sample incorrectly reported the item that subcutaneous injuries are the most common cause of occupational infections. This mean that nurses were not well oriented to the modes of bloodborne pathogens transmission. In contrast, a study held in Mazandaran province, Iran among 540 HCWs revealed that 78.4% of them answered this question correctly [2]. Another study conducted in Thailand, previously mentioned, indicated that most nurses knew that sharp injuries were the most important cause of acquiring bloodborne pathogens [14].

In general, the subjects of the study have unacceptable level of knowledge about UPs. This result is consistent with many studies [10, 15, 16, 17].

Fortunately, 92% of the sample disposed needles and other sharp objects in a puncture-proof container (table 3). A study held in Iran showed that 94.9% of HCWs performed this practice correctly [2]. Another study showed that 95% of HCWs have compliance with sharps disposing [18].

Seventy nine percent of the subjects agreed that reusable instruments should be autoclaved or disinfected (table 3). Contaminated equipments should be cleaned and disinfected [5,9].

Unfortunately, 77% of the respondents not complied hand washing (table 3). Many studies demonstrated suboptimal compliance with hand washing [14, 15, 19].

Table 3 showed that only 44% of the nurses wear gloves when they contact with blood and body fluids. Compliance with barrier precautions remains suboptimal in all healthcare settings and among all types of staff [20]. Two studies in Nigeria indicated that less than two-thirds of HCWs used protective barriers [11, 21].

In general, results of the study revealed that subjects have low compliance with UPs. This finding is consistent with many studies [10, 16, 19, 21, 22].

Findings indicated that a significant association between sample knowledge and their education level (table 4). This result was supported by a cross-sectional survey conducted in Pakistan to assess the Ups knowledge of 239 HCWs. Results indicated that prescribers have the highest knowledge score while the housekeepers have the lowest [23].

Table 5 presents a significant association between the sample knowledge and their years of experience." Knowledge is a mixture of comprehension, experience, discernments, and skills" [24].

There is a significant association between sample compliance with UPs and their level of education (table 6). This result is supported by a study conducted in Maharaj Nakorn Chiang Hospital involving 40 nurses indicated that compliance of registered nurses was significantly higher than that of the practical nurses [13].

Results of data analysis depicted a significant association between the subjects' compliance with Ups and their years of experience. A study held in north India among 266 HCWs supported this result. Findings revealed that compliance with Ups was associated with being in job for longer period [16].

Recommendations:

The study recommended the following:

1. An education program can be designed, conducted, and implemented to the nurses concerning UPs.
2. Infection control committee in each hospital should take a responsibility to ensure and facilitate implementation of UPs and providing periodic training for nurses.
3. The essential standards of UPs should be displayed in the forms of posters or booklets in all health facilities.
4. Regulations and policies should be instituted in all health facilities imposing nurses and other HCWs to implement UPs.
5. Analytic study need to be performed to determine factors that contribute to the nurses' noncompliance with the UPs.
6. Further and nation-wide studies can be conducted on a large sample size of nurses.

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