

Knowledge and practice of standard measures in occupational exposure to blood and body fluids among nurses in a University Hospital in the United Arab Emirates

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Abstract

This cross sectional study was conducted to assess the knowledge and practice of preventive measures in occupational exposure to blood and body fluids among nurses in a university hospital in the UAE. A pre-tested structured self administered questionnaire was used for data collection. The mean age of the respondents was 29.59±5.96 years and the median duration of clinical experience was 63 months ranging from 10 months to 264 months. Of the total, 25.7% reported having had exposure to splashes of blood and body fluids into the eyes or mouth. 98% of nurses reported that if there had been any splash of blood or body fluids it is important to rinse with plenty of running water. 98% knew that the ideal method of disposal of sharp waste (e.g. hypodermic needles) was to put it in a puncture proof container immediately after use. 93.1% of the nurses reported that the needle pricks, cuts or scratches should be bled by squeezing. 93% habitually used masks always during surgery and 80.4% always wore goggles during surgery. With regard to recapping of needles, 44.6% were aware that needles should be recapped by single hand technique after use and among them 93.3% practiced this method; there was a statistically significant association ($p < 0.001$) between the awareness and practice, but not between years of experience and needle recapping technique after use. The knowledge among nurses about preventive measures in occupational exposure to blood and body fluids is adequate but in practice it is inadequate.

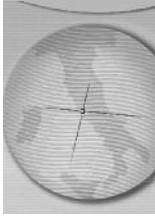
Key words: blood and body fluids, nurses, occupational exposure, prevention

Introduction

Nurses are at high risk of exposure to human blood and body fluids in their occupational environment. Injuries from sharp instruments and splashes of blood and body fluids place nurses at high risk for numerous blood-borne infections including human immunodeficiency virus, hepatitis B, and hepatitis C. Needle-stick injuries are the most common occupational accidents exposing nurses to infected blood and body fluids. These occupational accidents expose nurses to more than 20 different blood-borne pathogens [1] and result in an estimated 1000 infections per year, the most common being Hepatitis B, Hepatitis C and HIV, which are otherwise preventable [2]. According to World Health Report 2002, 2.5% of HIV cases and 40% of Hepatitis B and C cases among healthcare workers worldwide are the result of occupational exposure [3]. An European survey of needle stick injuries found that nurses are exposed more commonly than doctors or phlebotomists [4]. In a

study by Askarian et al. conducted in Shiraz, southern Iran in 2003, 70% of medical, 74% of dental, and 72% of nursing students reported having had at least one sharp instrument-related injury since beginning of their clinical education. Of note, 75 – 85% of these students did not report their injuries [5]. This degree of under-reporting is important because, in 2004, the estimated number of people in WHO Eastern Mediterranean region newly infected with HIV increased by 60% compared to 2003 [6]. Further complicating this situation is the inadequate supply of personal protective equipment and improper disposal of regulated medical wastes in Iran [6]. The most effective approach for averting blood-borne infections in nurses and other healthcare workers is the prevention of injuries with contaminated needles and medical devices [7], and reporting such injuries immediately to the authorities concerned.

A case report from Turkey emphasizes that blood splashes from patients, who are HCV



positive, onto the face or eyes is a risk for health care workers [8]. The knowledge of risk factors and the circumstances in which these exposures occur in hospitals can be very useful for developing proper preventive guidelines and educational programs. The present study was conducted to assess the knowledge and practice of preventive measures in occupational exposure to blood and body fluids among nurses in a university hospital in the UAE.

Materials and methods

All nurses working in one university hospital in Ajman, United Arab Emirates, were included in the study. The survey was conducted during the period between February and May 2009 and targeted Nurses involved in direct patient care (who were working in the healthcare setting and actively involved in patient care) and excluded those on vacation. They were given a structured, pre-tested, self-administered questionnaire containing both open- and closed-ended questions to assess their knowledge of standard precautions to be taken while handling blood and body fluids and the procedures to be followed after exposure to them. The questionnaire was constructed after a thorough review of literature and contained questions regarding knowledge of standard precautions in addition to socio-demographic information and duration of clinical experience. Prior to the commencement of the study, the questionnaire was piloted and necessary modifications made based on the observations arising from the pilot study. Study protocol was approved by the research and ethics

committee of the University. Before administration of the questionnaire, the purpose of the study was explained to each respondent and confidentiality of the information reported assured and informed consent obtained. Anonymity was maintained by asking them not to write their names in the questionnaire. A total of 101 nurses were included in the study. The response rate was 100%. After its collection, data were entered in Microsoft Excel and analyzed using SPSS version 17. A descriptive analysis was carried out for categorical variables and analysed by Chi square test. A p-value of <0.05 was considered as statistically significant.

Results

A total of 101 nurses participated in the study. Among them 11 (10.9%) were males and 90 (89.1%) were females. Age ranged from 19 to 48 years with a mean age of 29.59 ± 5.96 years. Median duration of clinical experience was 63 months ranging from 10 months to 264 months. 52 (51.5%) participants had been professionally active for between 1 and 5 years. The details are given in Table 1.

In the present study, 26 (25.7%) nurses had exposure to splashes of blood and body fluids into their eyes or mouth. Among them, 53.8% had a work experience of less than five years. The details are given in Table 2. The proportion of exposure to splashes of blood and body fluids into their eyes or mouth among male and female nurses were found to be 27.3% and 25.6% respectively. The majority of nurses $n=99$ (98%) reported that if there was any splash of blood or body fluids into the eyes or mouth, it was

Table 1. Socio demographic characteristics of the participants.

	Group	Years of work experience						Total	
		<=5		5-10		>10		No	%
		No	%	No	%	No	%		
Exposure to blood and body fluid	Yes	14	26.9	9	27.3	3	18.8	26	25.7
	No	38	73.1	24	72.7	13	81.3	75	74.3
Opinion on disposal of sharp waste	Put in an open basket	--	--	2	6.1	--	--	2	2.0
	Put in a closed puncture resistant basket	52	100.	31	93.9	16	100.0	99	98.0
Recapping	By Single hand	32	61.5	18	54.5	7	43.8	57	56.4
	By Both hands	20	38.5	15	45.5	9	56.3	44	43.6

important to rinse with plenty of running water.

Among the present study group, 93.1% of the nurses thought that if accidents involving needle pricks, cuts or scratches occurred, they should be bled by squeezing and 93.1% reported that they should be washed thoroughly with soap and water. Only 78.2% felt that a water proof dressing should be applied. It was observed that 89(88%) of the participants thought that the length of the sleeves of lab coats determines the level of protection. It was observed that 30.7% of the participants were of the opinion that the used syringes should be disposed after recapping. With regard to the awareness on disposal of sharps tools, 98% were of the opinion that the ideal method to dispose of sharp waste was to put it in a puncture proof container and 52.5% of whom had a work experience of less than 5 years. The details are given in Table 2.

All nurses expressed that surgical aprons should be worn during surgery but only 98% used surgical aprons always during surgery. Also, 99% were of the opinion that masks should be worn during surgery though it was observed that only 93% of nurses habitually used masks always during surgery. Among the 92 nurses who reported that goggles should be worn during surgery, only 74 (80.4%) of them actually used goggles always during surgery.

With regard to recapping needles, only 45 (44.6%) were of the opinion that needles should be recapped by single-hand technique after use and among them only 42 (93.3%) practiced this single-hand technique to recap needles after use. There was a statistically significant association ($p<0.001$) found between the knowledge and practice of nurses on recapping of needles after use. The details are given in Table 3. Among them 55.6% were in the group with experience of less

than 5 years. No statistically significant association was observed between experience and technique of recapping needles after use.

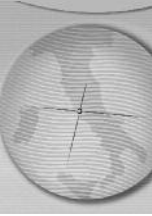
All participants were of the opinion that it is necessary to be aware of the standard precautions in order to prevent acquiring infections from blood or body fluids of patients, and 92.1% were willing to take part in training aimed at imparting knowledge of standard precautions to those who were not aware of such best practices.

Discussion

The most effective means to put a stop to the occurrence of blood borne diseases is by preventing exposure to blood and body fluids. Work-related exposures need urgent medical attention to ensure timely post-exposure management. Needle stick injuries (NSI) and exposure to splashes of blood and body fluids (BBF) among health care workers have been reported from different parts of the world. Alamgir et al. in their study observed that splashes occurred most frequently at the patient's bedside (46.1%) and predominantly affected the eyes or face/mouth of healthcare workers [9]. A study in Turkey reported that the prevalence of blood and body fluid splashes was 7.3% [10]. A prospective study was conducted to determine the incidence of blood splashes to the masks and goggles of surgeons, assistants, and scrub nurses. The study observed that the rate of blood splashes was 62.5% on surgeons' masks, 63.2% on surgeons' goggles, 35.4% on assistants' masks, 38.9% on assistants' goggles, 11.1% on scrub nurses' masks, and 16.0% on scrub nurses' goggles. The study also recommended the use of masks and eye wear during routine surgical procedures [11]. In the present study too, about 25.7% of the nurses had exposure to splashes of blood and body fluids into

Table 2. Exposure to blood and body fluids according to work experience.

Socio demographic variable	Group	No	%
Age	<25 years	11	10.9
	25-29 years	48	47.5
	30-34 years	24	23.8
	35-39 years	6	5.9
	>=40 years	12	11.9
Gender	Male	11	10.9
	Female	90	89.1
Work experience	<=5 years	52	51.5
	5-10 years	33	32.7
	> 10 years	16	15.8



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their eyes or mouth. Compared to some of the other studies (which ones??), the exposure was less among the nurses in this teaching hospital. The exposure to blood and body fluids, especially splashes into the eyes and mouth, may perhaps be due to carelessness at work site and negligence in using protective guards.

A study conducted in an Australian tertiary care hospital revealed an accident rate of 47% for sharp objects-related injuries and 68% for body fluid exposures among nurses and also reported rates of 38% and 16% respectively among other medical staff [12]. Zafar et al. identified that about 45% of personnel reported having had a needle stick injury in the past and the frequency of injury was significantly higher among doctors compared to nurses. Two thirds of the participants were familiar with the prevention protocols but practices of nurses were generally safer than doctors [13]. Another study in Turkey, aimed to determine the prevalence of sharp objects-related injuries and blood and body fluid splashes in health care workers during elective surgery procedures, found that the incidence rate of sharp injuries among nurses was 6.3 per person year [10]. A study conducted in Lebanon observed that the rate of exposure among nurses was 5% [14]. In the present study, 20.1% experienced sharp objects-related injuries and 93.1% of the nurses reported that the needle pricks, cuts or scratches should be bled out by squeezing and 93.1% expressed that cuts should be washed thoroughly with soap and water. Compared to few studies quoted above, the incidence of needle stick injuries was higher in the present study. However the awareness of immediate management of needle stick injuries was high among the study subjects.

A study in Nigeria observed that about 56.5%

had never worn goggles during birth deliveries and at surgeries [15]. In our study, the use of goggles was comparatively high (80.4%). Ganczak et al. in their study observed a high compliance for glove use (83%), but much lower for protective eyewear (9%). Only 5% of respondents routinely used gloves, masks, protective eyewear and gowns when in contact with potentially infective material. The most commonly stated reasons for non-compliance were non-availability of PPE [16]. All nurses in our study revealed that surgical aprons should be worn during surgery but only 98% actually used surgical aprons always during surgery. Also 99% were of the opinion that masks should be worn at all times during surgery but only 93% were actually using masks always during surgery. There was not much difference between knowledge and practice with regard to the use to protective guards while assisting surgical procedures.

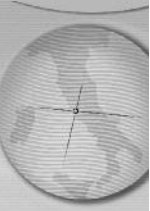
Jacobson et al., in their study, observed that 33% of the injuries derived from improperly disposed objects, generally in trash baskets in patient rooms [17]. Moss et al. reported that 28% of sharp-objects usage were managed in such a way that excess risk was conferred to the user, to another person, or to both. About 1% of sharp objects were inadvertently thrown into the trash [18]. With regard to the awareness about the disposal of sharp objects, the present study observed that 98% were of the opinion that the ideal method to dispose of sharp waste was to put it in a puncture proof container after use. The high percentage of awareness about method of disposal of sharp objects may be associated with the continuing nursing education programs conducted on a regular basis by the University.

A study conducted in Nigeria among health care workers (doctors, trained and auxiliary nurses,

Table 3. Cross tabulation of Recapping Knowledge and Practice.

Recapping Knowledge	Recapping -Practice				Total
	By single hand		By both hand		
	No	%	No	%	
By single hand	42	93.3	3	6.7	45
By both hand	15	26.8	41	73.2	56
Total	57	56.4	44	43.6	101

P<0.001



laboratory scientists and domestic staff) by Sadoh et al observed that about a third of all respondents always recapped used needles [15]. Gurubacharya et al reported that 79% of the participants were of the impression that needles should be recapped after use [19]. In the present study 30.7% of the participants were of the opinion that the used syringes should be disposed after recapping. A Brazilian study reported that the correlates of percutaneous injuries include duration of work and work shift, in addition to the practice of recapping needles [20]. Moss et al observed that 20% of needles were recapped using a two-handed technique and 64% were disposed of uncapped [18]. With regard to recapping of needles, in the present study, 44.6% were of the opinion that needles should be recapped by single hand technique after use and among them only 93.3% practiced this technique. Recapping

by single hand technique may reduce the risk of exposure to needle stick injuries among health care workers.

Conclusions

The study concluded that knowledge of preventive measures to be practiced regarding occupational exposure to blood and body fluids was found to be adequate among the study group whereas in practice it was not satisfactory. An effective and goal-oriented educational program targeting nurses and the establishment of a surveillance system for registering, reporting and managing occupational exposure in hospitals, should be made mandatory. Further research into how nurses make a risk assessment at the time of exposure could provide useful information when developing education strategies or exposure management protocols.

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