

## Original Article

# Universal Precautions that Surgical Nurses are taken for Preventing from Diseases Transmitted by Blood and Body Fluids in Istanbul

**Sabriye Sibel Taze RN, MSc**

Istanbul University Cerrahpaşa Medical Faculty Istanbul/Turkey

**Ikbal Cavdar, BSN, MSc, PhD**

Associate Professor, Istanbul University, Florence Nightingale Faculty of Nursing Surgical Nursing Department,

**Correspondence:** Sabriye Sibel Taze, Istanbul University Cerrahpaşa Medical Faculty Istanbul, Turkey E-mail: sibeltaze@gmail.com

### Abstract

**Background:** Human Immunodeficiency Virus (HIV), Hepatitis B (HBV), Hepatitis C (HCV) infections which are infected through blood and body fluids pose great risks for healthcare workers and the exposure frequency to blood and body fluids is especially more common among medical doctors and nurses working in surgical units.

**Aim:** The aim of this study is to determine the universal precautions that surgical nurses are taken for preventing from diseases transmitted by blood and body fluids.

**Methodology:** It was conducted with the participation of 410 surgical nurses working in two big university hospitals. Universal check-list containing 27 universal precautions was used and additional demographic information was collected (n=410).

**Results:** In this study 34.1 % of the participants were aged between 26 and 31 and 73.2 % of them received education about diseases infected through blood and body fluids. It was also found out that 50.2 % of them (n=206) didn't take enough precautions regarding being protected against diseases and 61.6 % of those who didn't take precaution didn't do so because of the lack of equipment. Lastly, the nurses who work in operating room were found to have high scores in implementing universal precautions.

**Conclusion:** Healthcare workers working under risk should be informed about universal precautions in order to protect themselves from the diseases infected through blood and body fluids.

**Key Words:** Universal precautions; diseases infected through blood; surgical nurse

### Introduction

Human Immunodeficiency Virus (HIV), Hepatitis B (HBV), Hepatitis C (HCV) infections which are infected through blood and body fluids pose great risks for healthcare workers. Nurses come first among the healthcare workers who are affected most intensely by risky situations caused by working conditions (Göçer et al., 2001; Joseph, 1997; Aktaş, 2001; Güçük et al., 2002; Tayran, 2001). Health care employees working in surgical units are under risk

regarding occupational viral infections such as HIV, Hepatitis B, Hepatitis C which are transmitted through blood ( Mohebati et al. 2010)

Luo et al., (2010) found out that wounding by sharp objects and exposure rate to blood and body fluids are greater in nurses working in surgical units compared to other units. According to the data announced by The Ministry of Health, 2254 cases of HIV took place in Turkey in 2006. Moreover, various studies conducted in different parts of

Turkey showed that on average 3, 5 % of the healthcare workers were found to have Hepatitis B surface Antigen (HBs Ag) positive and 17,9 -52,9 % of them have Anti-HBs Ag positive (Akçam et al., 2005). 1- 3 % of the population in Turkey is estimated to be Hepatitis C vector (Demirtürk, 2003). Centers for Disease Control and Prevention (CDC) announced universal precautions towards preventing infections of HIV, HBV, and HCV in 1988 (Knight, 1998). The main principle of universal precautions is that all the healthcare workers regard all patients as being infected with HIV, HCV, HBV and diseases infected through blood and take preventive precautions (Aktaş, 2001; CDC, 1998). Infections observed among healthcare workers are known to take place through contact with blood and body fluids. As for the reasons for this, pricking the used injection to himself/herself, getting wounded by sharp objects which have been infected by blood and entrance of infected material into mucous membrane and impaired skin due to scratch, cut, and lesion can be mentioned. According to the studies conducted in Turkey, it has been found that most of the healthcare workers do not report wounding, are not well-informed about safeguard measures and do not take precautions due to ignorance (Aktaş, 2001; Ayrancı and Köşgeroğlu, 2004).

This study was planned to determine the universal precautions that surgical nurses are taken for preventing from diseases transmitted by blood and body fluids.

### **Research Questions**

- Do nurses working in the surgical units implement the universal precautions?
- Which factors affect the implementation of the universal precautions taken by the nurses working in the surgical units?

### **Methodology**

#### **Study Design**

The cross-sectional and descriptive study was conducted at two hospitals in Istanbul,

Turkey. The study was conducted. Two of the hospitals are large-capacity university hospitals. The study sample was composed of those who work day shift on the surgical wards of the hospitals. Participants included 410 surgical nurses.

### **Instruments**

Data were collected on a questionnaire that was prepared based on the literature and checklist including universal precautions was also used.

The first section included nurses' demographic information, their status for receiving education about being protected against diseases infected through blood and body fluids and also whether they have been wounded by stinging or sharp objects in the last 6 months, precautions they have taken against such diseases and 24 questions prepared with the aim of determining factors which influence taking precautions.

In the second section, the checklist that contains 27 statements about universal precautions reported by CDC was designed by the researcher. Each question in the checklist which includes universal precautions has three options: yes, no and sometimes. 27 questions were considered as raw scores and standardized to the score of 100.

Scores were calculated by scoring "correct answer" as 1 point, "wrong answer" as -1 point and "sometimes" as 0. Questionnaire form was first implemented with 50 nurses as a pilot study. Comprehensibility of the questions was evaluated in the pilot study as well as whether there was something missing or not. Necessary changes were made afterwards.

### **Data Collection**

Nurses working in surgical units were informed about the aim, content and method of the study and those who accepted to participate were included in the sample group. The data were collected one time in an appropriate room on the ward where

participants worked. The form took approximately 25 minutes to complete.

### Ethical Considerations

Prior approval for the study was received from the ethics Committee of Istanbul University's Faculty of Medicine Hospitals.

### Data Analysis

Data were collected in numbers and percentages as descriptive statistics whereas scores were obtained as mean  $\pm$  standard deviation. Statistica 10.0 statistical software was used for statistical analysis. A *P* value of  $< 0.05$  was considered statistically significant.

### Results

In this study 34.1% of the participants were aged between 26 and 31 and 98.8% of participant nurses were female. It was found out that 73.2% (n=300) of the participants received special training about protection against diseases infected through contact with blood, 19.5% (n= 80) of them suffered from such diseases, and 97.5% of them had Hepatitis B infection (n= 78). Moreover, 30 % of the nurses have been wounded by stinging or sharp objects in the last 6 months (n=123), 44.7% of them were wounded while putting on injector tap (n=55), and 30% of them while preparing for (n=37) intravenous (IV) and intramuscular (IM) treatment (Table 1).

It was found out that 83.6% (n=343) of the sample group regard blood and body fluids as infective whatever the diagnosis is, and 87.1% (n=357) and 97.3% (n=399) stated that they wash their hands after touching each patient and taking samples of blood and other body fluids, respectively. Besides, 95.1% (n=390) of them put on gloves if there is any risk of contamination with blood or body fluids, 31.5% (n=129) sometimes change gloves after each patient, and 53.7% (n= 220) of them put on double gloves in situations of high risk of getting wounded in order to reduce the risk of infection through contact with blood and body fluids.

Only 3.7% of them out of 84.3% (n=346) use protective glasses in practices with the risk that patient's blood and body fluid might splash and 32.7% (n=134) wear masks and 33.2% (n=136) wear protective apron. A 96.6% (n=396) of them wash with water and soap immediately if blood or body fluid of the patient splashes onto their eyes or faces. As for uses, 71.7% (n=294) of them put the plastic tap on before throwing away the injector, 92.7% (n=380) of them throw the injector into needle box after using it. What is more, 90.2% (n=370) of them behaved cautiously to avoid being wounded while using injector and 94.9% (n=389) of them make sure that needle box is thrown away safely by covering it properly when it is full, 75.9% (n= 311) of them make certain part of their body bleed by squeezing if they are wounded by an object contaminated by patient's blood or body fluid and 96.8% (n=397) of them wash that wounded part by cleansing with water and soap and then anti-septic. A 59.3% (n=243) of them avoided direct contact with the patient if they have any open wound and 84.6% (n=347) of them did the same if the patient have to be resuscitated. A 87.3% (n= 358) of them try to make sure that laundry be sent to laundry service properly and 97.3% (n=399) of them throw infected waste away into specially-allocated waste bins and 89.8% (n=368) of them take necessary precautions carefully taking serology test results of their patients into consideration (Table 2).

When nurses' status of taking universal precautions in accordance with their duties in their working units is considered, their score averages have been found to be high and statistically significant (Table 3), ( $p= 0.001$ ).

As seen in Table 4 as well, 50.2% (n=206) of the nurses believe that they do not take precautions sufficiently toward being protected against diseases infected through blood and body fluids and 61.6% (n=127) of them said that the main reason for lack of precautions was insufficient amount of equipment.

## **Discussion**

Based upon the fact that nurses working in surgical units are under greater risk of being infected through contact with blood and body fluids compared to other nurses, this study was planned in order to determine the universal precautions surgical nurses take.

It was stated in a study conducted by Luo et al., (2010) that 50% of the nurses received training about being protected against diseases infected through blood and body fluids. In this study we found out that 73.2% of the nurses working in surgical units received such training. The fact that the percentage of nurses' receiving the mentioned training is high shows that institutions pay great attention to universal precautions and also infection control committee works actively.

World Health Organization (WHO) estimates that annually 1000 healthcare workers are infected with HIV, and 66,000 with HBV, and 16,000 with HCV due to percutaneous wounding around the world. It also estimates that 304,000 healthcare workers are injured at least once a year by sharp and stinging objects (Samayoa et al., 2006; Puro et al., 2005). Ertem et al., (1999) and Kişioğlu et al., (2002) found out that the chances that nurses working in surgical units are injured are greater than those in other units. Baybek and Aka, (2003) determined the rate of injury to be 37, 7%, whereas Altıok et al., (2009) as 23.9%. In our own study, 30% of the participants have been exposed to injury by sharp and stinging objects in the last 6 months and 44.7 % of the injuries took place while putting the injector tap on (Table 1). However, in the studies conducted by Gücük et al., (2002) and Doğanç, (2004) most of the injuries occurred while breaking ampule.

Motamed et al., (2006) stated the following finding: The percentage for considering blood and body fluids as infective was 98.7% and 98.6% among the nurses whatever the diagnosis is. The percentage for the same item was 83.6% in our study.

One of the most important methods of preventing infections is to wash the hands and Bamigboye and Adensanya, (2006) reported that 53.8% of the nurses washed their hands after contacting with the patient whereas Sadoh et al., (2006) and Reda et al., (2009) said it was 94.6% and 33.9%, respectively. However, in this study it was found to be 87.1%. Moreover, the finding that 98.8% of the nurses definitely washed their hands if they were contaminated with blood or body fluids whatever the diagnosis is shows resemblance to the study conducted by Askarian et al., (2005).

In one study (Baybek and Aka, 2003) the rate for nurses' washing their hands after taking their gloves off was high while it was low in another study (Reda et al., 2009). However, it was reported to be 84, 2 %. In the study conducted by Bennett and Mansell, (2004), the rate for wearing gloves was 93% in the presence of contacting with blood and body fluids whereas we determined the same rate as 95.1%. However, when changing gloves for each patient is considered, 60% of the participant nurses wore gloves in our study, which shows resemblance to the one conducted by Baybek and Aka, (2003) with 50.8%. The fact that the rate for changing gloves is low makes one think that nurses wear gloves only to protect themselves, and they ignore the fact that wearing the same gloves while tending to all patients can pose risk of transmitting the infections. At the same time, maybe they do not change gloves for each patient due to the lack of equipment. Kim et al., (2001) stated that wearing double gloves reduce the transmission of diseases infected through contact with blood and body fluids when compared to wearing just one piece even though it does not prevent injury in practices with higher risk of being injured. Askarian et al., (2005) found out that 25.2% of the nurses wear double gloves in risky situations. On the other hand, 53.7 % of the nurses in our study reported to wear double gloves when the risk for being injured is high. Study findings show that the habit of wearing double gloves is very low among the nurses.

**Table 1: Age, education status about protection against diseases infected, and the Status of being injured by sharp-stinging objects in the last 6 months and undergoing infections transmitted through blood**

Characteristic	n	%	
Age groups	20-25	79	19.2
	26-31	140	34.1
	32-37	61	14.9
	38-43	98	23.9
	44-49	32	7.9
Education status about protection against diseases infected through contact with blood	Yes	300	73.2
	No	110	26.8
Undergoing disease infected through blood	Yes	80	19.5
	No	330	80.5
Disease undergone (n=80)	Hepatitis B	78	97.5
	Hepatitis C	1	1.25
	Don't want to say	1	1.25
Status of being injured in the last 6 months (n=410)	Injured	123	30.0
	Not injured	287	70.0
Injury cause (n=123)*	Putting the injector tap on	55	44.7
	Preparing for IM and IV treatment	37	30.0
	Throwing sharp objects into trash	18	14.5
	Equipment exchange during operation	14	11.4
	While fixing IV catheter	8	6.5
	Bloodletting	8	6.5
	During IM injection	1	0.8

\*Multiple choose

**Table 2: Status of nurses' implementing universal precautions**

Universal precautions		Yes	No	Sometimes		
I wash my hands if they are contaminated with blood or body fluids of the patient whatever diagnosis is.	405	98.8	2	0.5	3	0.7
I wash my hands after bloodletting or taking any other kind of body fluids.	399	97.3	4	1.0	7	1.7
I try to throw away infected materials into specifically allocated trash bins.	399	97.3	1	0.2	10	2.5
If I get injured by an item contaminated with patient's blood or body fluids. I clean that part by washing it with water and soap and then antiseptic.	397	96.8	6	1.5	7	1.7
I immediately wash my face and hands with water and soap if patient's blood or body fluids splash on my eyes or face.	396	96.6	5	1.2	9	2.2
I wear gloves if there is any risk of contamination through blood or body fluids of the patient.	390	95.1	7	1.7	13	3.2
I make sure that the needle box is thrown away by putting the tap on properly when it is full.	389	94.9	4	1.0	17	4.1
I definitely throw away the injector into needle box.	380	92.7	20	4.9	10	2.4
I throw away the injector by separating it from its needle.	370	90.2	20	4.9	20	4.9
I behave very cautiously not to be injured while using the injector.	370	90.2	11	2.7	29	7.1
I take necessary precautions in line with serology results of the patient.	368	89.8	16	3.9	26	6.3
I change my gloves when they are torn or pierced.	367	89.5	6	1.5	37	9.0
I wear gloves in all invasive practices and contacts with mucous membrane or skin whose unity is spoilt.	363	88.5	11	2.7	36	8.8
I wash my hands after taking off y gloves.	360	87.8	9	2.2	41	10.0
I make sure that laundry be sent to laundry service properly if they are contaminated with blood and body fluids.	358	87.3	21	5.1	31	7.6
I wash my hands upon contacting with each patient.	357	87.1	7	1.7	46	11.2
I avoid direct contact if the patient needs to be resuscitated.	347	84.6	27	6.6	36	8.8
I consider all blood and body fluids of patients as infective whatever the diagnosis is.	343	83.6	20	4.9	47	11.5
I wash my hands before and after all invasive practices.	336	82.0	7	1.7	67	16.3
If I get injured by an item contaminated with patient's blood or body fluids, I make that part bleed by squeezing.	311	75.9	68	16.6	31	7.5
I put the injector tap on before throwing it away.	294	71.7	64	15.6	52	12.7
I change my gloves after each patient.	246	60.0	35	8.5	129	31.5
I avoid direct contact with the patient till recovery if I have an open wound.	243	59.3	74	18	93	22.7
I wear double gloves in order to reduce the risk of disease infections transmitted through blood and body fluids when the risk of injury is high.	220	53.7	86	21.0	104	25.3
I wear protective apron in practices where patient's blood or body fluids have the risk of splashing.	136	33.2	157	38.2	117	28.6
I wear masks in practices where patient's blood or body fluids have the risk of splashing.	134	32.7	153	37.3	123	30.0
I always wear protective glasses in practices where patient's blood or body fluids have the risk of splashing.	15	3.7	346	84.3	49	12.0

**Table 3: Implementing universal precautions according to working units**

Unit works	n	Mean $\pm$ SD	P
General Surgery	58	39.53 $\pm$ 15.20	<b>0.001</b>
Paediatric Surgery	16	45.83 $\pm$ 14.17	
Plastic Surgery	11	42.08 $\pm$ 21.29	
Cardiovascular Surgery	17	45.09 $\pm$ 12.64	
Surgical Intensive Care	53	53.32 $\pm$ 13.36	
Gynaecology	44	44.27 $\pm$ 14.26	
Emergency Unit	42	48.50 $\pm$ 14.14	
Neurochirurgia	35	39.57 $\pm$ 16.84	
Orthopaedic	32	46.64 $\pm$ 12.22	
Otorhinolaryngology	18	46.71 $\pm$ 12.90	
Urology	11	44.11 $\pm$ 19.13	
Ophthalmic	25	53.63 $\pm$ 12.11	
Thoracic Surgery	7	43.38 $\pm$ 21.14	
Operating Room	41	55.19 $\pm$ 10.7	

**Table 4: Belief in taking enough precautions and factors affecting this**

<b>Taking enough precaution (n=410)</b>	<b>n</b>	<b>%</b>
Yes	204	49.8
No	206	50.2
<b>Factors affecting taking necessary precautions (n=206)*</b>		
Lack of Equipment	127	61.6
Not being able to work at ease	99	48.0
Lack of time	77	37.3
Taking precautions in line with serology results	58	28.1
Ignorance, not paying enough attention	30	14.5

\*Multiple choose

The fact that 88, 5 % of the nurses in our study reported to wear gloves when there is a possibility of contacting with blood and body fluids and invasive situations shows resemblance to the study conducted by Chan et al., (2002) with 83 %.

Gershon et al.,(1999) reported that 53.5% of the healthcare workers wear glasses, 33.9% of them wear protective apron and 47.2% wear masks. In this study for the same items 3.7%, 33.2% and 32.7% were determined respectively. The fact that the rate for wearing glasses in the study by Gershon et al., (1999) is far greater than our study shows that wearing protective glasses is not common among nurses in Turkey and it is not a habit. Even though the rate for wearing masks and protective apron is similar, it is lower in our study. It shows that wearing

these items is ignored and the reason can be lack of equipment.

Throwing the injector away after putting the tap on again increases the risk of injury. According to Baybek and Aka, (2003) the rate for such situation is 88.4% whereas it is 41.5% in study by Reda et al., (2009). However, in this study the rate for throwing away the injector after putting the tap on is 71.7%, and the rate for getting injured during this process is 44.7%. Study findings illustrates that the habit of throwing the injector after putting the tap on is quite common. A 94.9% of the nurses were observed to make sure that needle box is thrown away safely by covering it properly when it is full. On the other hand, Chan et al., (2002) stated the same rate as 43.2%. The reason for different rates can be the



difference in the system of throw away policy.

According to the study by Gücük et al., (2002) none of the nurses made the injured part of the body bleed by squeezing whereas 75.9% of our participants made it bleed by squeezing the injured part after getting injured by sharp objects. It proves us that nurses do not know that they are not to make the injured part bleed.

It is quite clear that considering all patients' blood and body fluids as infective while tending to patients, whatever the diagnosis is, is crucial and necessary precautions be taken. 89.8% of the nurses were found to take precautions according to their serologic conditions while tending to them. Conversely, in the study conducted by Chan et al., (2002) a 84.6% of the nurses stated that it is wrong to take universal precautions only in patients with HIV and HBV, which shows no resemblance to our study. It makes one think that even though they take necessary precautions according to their serologic conditions and consider blood and body fluids of each patient as infective, they do not do this in practice.

When the correlation between nurses' scores for practicing universal precautions and the units they work is considered, nurses working in operating room have higher scores compared to other units. It indicates that operating room nurses are aware that they are under greater risk than others in terms of diseases infected through blood and body fluids and therefore, they behave cautiously.

In addition, the fact that 50.2% of the nurses think that they cannot take enough precautions against such diseases and 61.6 % of them see lack of equipment as not being able to take precautions reveals the significance of accessible equipment while implementing universal precautions.

### Limitation

The major limitation of this study was that participants were recruited from nurses who

had worked two university hospital in Istanbul. Therefore, the results of this study can only be generalized to the sample of this study. Future studies should include a larger sampling.

### Conclusions

To sum up, surgery nurses do not take enough precautions for being protected and consider the lack of equipment as the main reason. In line with these findings nurses who are under risk against diseases infected through blood and body fluids are to be informed by infection control committees in hospitals and awareness among healthcare workers should be raised in order to implement the precautions effectively.

### Contributions

Study design: SST, IC; data collection and analysis: SST and manuscript preparation: SST, IC. This study is a post-graduate thesis.

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