Original Article

The Attitudes, Behavior and Beliefs of Midwifery Students Regarding Blood Borne Agents that Cause Systemic Infections

Fatma Ay, PhD
Assistant Professor, Istanbul University, Faculty of Health Science, Bakirkoy Istanbul, Turkey

Nuran Gencturk, PhD
Assistant Professor, Istanbul University, Faculty of Health Science, Bakirkoy Istanbul, Turkey

Esma Demirezen, PhD
Assistant Professor, Istanbul University, Faculty of Health Science, Bakirkoy Istanbul, Turkey

Correspondence: Fatma Ay, PhD, Assistant Professor, Istanbul University
Faculty of Health Science, Demirkapı Caddesi, Karabal Sokak, Ruh ve Sinir Hastalıkları Hastanesi Bahceici, 34740 Bakırkoy Istanbul e-mail: fatmaay@yahoo.com

Abstract

Objective: This study was performed in order to determine the attitudes, behavior, and beliefs of midwifery students regarding the spreading, treatment/care, and control methods for blood borne agents that cause systemic infections.
Method: The data for this descriptive and cross sectional study were collected by using the "Data gathering form" that was prepared through using information from the literature. The study was performed between May 1st 2013- June 1st 2013 with the participation of 166 students from the Midwifery Department of the Istanbul University School of Health Sciences.
Findings: 24.7% stated that they were wounded with contaminated needles during clinical applications. To protect themselves during invasive interventions, 75.3% of the students stated that they would "wear gloves". While 42.2% of the students think HIV/AIDS spreads through flies, mosquitoes, and ants, 50.0% think it may spread through swimming in the same pool with an infected person. The rate of thinking that Hepatitis C may spread through dried blood increased with decreasing total years of study, and there was a meaningful difference between classes ($p \leq .05$). When the current year the students studied and reasons for not getting a tattoo were compared, a statistically meaningful difference was found in avoiding tattoos for medical reasons ($p \leq .05$).
Conclusions: Midwifery students, who have a high likelihood of contacting blood borne agents that cause systemic infections, need information on protection, precaution, and the ways these agents spread. Most of the midwifery students need information on necessary post exposure applications as well as standard precautions.

Key Words: HIV/AIDS, Hepatitis B and C, midwifery students, systemic infections, midwifery, student.

Introduction

Although obstetricians carry many professional risks, they also constitute a risk for the patients, other health care employees, family members, and the society through the infections they may acquire at work. Blood borne agents that cause systemic infections are Hepatitis B, Hepatitis C, and the Human Immunodeficiency Virus (HIV). The World Health Organization (WHO) and the International Labor Organization (ILO) have accepted Hepatitis B and Hepatitis C as professional diseases for health care professionals (Aygun, 2007; Tuzun et al., 2005). For health care employees, the possibility of developing a blood infection after professional contact are estimated to be 0.3% for HIV, 0.5-10% for the Hepatitis C virus (HCV), and 6-30% for the Hepatitis B virus (HBV) (Puro et al., 2005; Fullerton & Gibbons, 2011).

In the report issued by the Center of Disease Control (CDC), every day at least 1000, and 385000 health care employees are stated to be wounded by injectors and cutting tools (CDC, 2017). In Europe, every year at least 304000 health care employees are thought to be wounded with a sharp object infected with HBV. The numbers for HCV and HIV are thought to be 149000 and 22000, respectively (Puro et al.,

2005). Although the rate of percutaneous injuries have decreased significantly throughout the world with the use of safe disposable materials in health applications, the rate is still 50-70% in Turkey (Altıok et al., 2009). It is very important to teach health care professionals the right attitudes and behavior, which are based on correct information, regarding blood borne diseases and patient care. This study was performed in order to determine the attitudes, behavior, and beliefs of midwifery students regarding the spreading, treatment/care, and control methods for blood borne agents that cause systemic infections.

Method

This descriptive and cross sectional study was performed between May 1st 2013- June 1st 2013 with the participation of students from the Midwifery Department of the Istanbul University School of Health Sciences. The universe of the study consisted of 203 registered midwifery students. 34 students who either didn't want to participate, or weren't at school at the time were excluded from the study. Additionally, two students who didn't complete the questionnaire and one who answered the questionnaire in a meaningless and inconsistent manner were excluded. 166 students formed the sample of the study. In the study, a sample selection wasn't made with the intention of reaching the whole universe.The data for the study was collected by using the "Data gathering form" that was prepared through using information from the literature. In the first section, which consisted of 12 questions, the demographic properties of the students and their status of contact with a Hepatitis B, Hepatitis C, or HIV (+) individual were questioned. Through 6 open ended and 25 yes or no questions, the attitudes, behavior, and beliefs of midwifery students regarding the spreading, treatment/care, and control methods for blood borne agents that cause systemic infections were determined.Data was evaluated digitally using package programs. The descriptive statistics pertaining to each variable were given as numbers and percentages. The independence controls of variables showing categorical properties were made with chi-squared tests, and a result of $p<0.05$ was considered statistically meaningful.

Ethical considerations

A written permission was taken from the school administration by explaining the purpose of the study and presenting a sample of the data tools. Only willing participants were given the questionnaire, and the purpose of the study as well as the desired method of answering the questionnaire was explained by the researchers to the participants.

Results

Among the participants, 31.9% were first year students. The mean age of the students was 21.25±3.11. When the students were asked if they had a sexual experience, only 4.8% (n=8) of them said yes and 5 of these students were married. It was found that 87.3% of the students received Hepatitis B vaccine. It was determined that 24.7% of the students were injured by a contaminated needle during clinical practice. Among the students, 76.5% reported that they had a patient with Hepatitis B or C or HIV/AIDS and 66.3% provided care for these patients. It was found that 9% of the students had a friend who was HIV (+), 14.5% had a HIV (+) relative, and 45.8% came into contact with a person with Hepatitis B or C or HIV/AIDS (Table 1). Among the participants, 66.3% of the students reported that they would feel anxious about providing care for a person with Hepatitis B or C or HIV/AIDS and 57.2% of these students reported that they were anxious about being infected. When the students were asked about what they did when they had a sharps/needlestick injury, 33.1% reported that they received “medical intervention/application” and 18.1% reported that they “washed their hands”. However, the students reported receiving tests, vaccines, and first aid, presenting at the emergency service, controlling patients’ tests, tourniquet application, dressing, and applying pressure as medical interventions. When the students were asked about what they did for protecting themselves during invasive interventions, 75.3% stated that they wore gloves. Only 1.2% reported that they would use universal precautions other than wearing gloves. Responses such as using sterile material, performing sterile procedures, being careful, and receiving vaccines were categorized as “other” and only 12% of the students gave these responses. Among the students, 72.9% reported that they washed their hands with water and soap when their hands were contaminated by the patient’s blood or bodily fluids and 28.3% reported that they washed their hands with antiseptic/disinfectant (Table 2).

It was found that 42.2% of the students would not have a tattoo due to personal reasons such as "I do not like it, it is ugly, I am afraid, it is absurd, it is unnecessary, I am not interested in it, I do not wish to change my appearance", 24.7% would not have a tattoo due to medical risks, and 20.5% would not have a tattoo since it is against their religious beliefs.

When Table 3 was examined, it was observed that the students had information about the ways of Hepatitis B or C or HIV/AIDS contamination. However, 42.2% of the students thought that mosquitos, flies, and ants can spread the disease and 50% thought that swimming in the same pool with a person with HIV/AIDS would lead to contamination. In addition, 46.4% of the students thought that people with HIV/AIDS should be treated at separate hospitals and 33.1% thought that substance users are the main carriers of diseases.

Among the students, 53% reported that they would not use another person's forks, spoons, knives, etc. in order to protect themselves from blood borne diseases, 49.4% reported that they would not have a manicure or pedicure, and 44.6% reported they would use condoms during sexual intercourse.

When we compared protection methods during invasive interventions (being injured by a contaminated needle, applications performed in case of injury) and applications performed in case of contamination through blood, bodily fluids, etc. with the year of study, we found no significant differences. When we compared the likelihood of being anxious during providing care for a person with Hepatitis B or C or HIV/AIDS (+) with the year of study, we found a significant difference. It was determined that the level of anxiety decreased as the year of study increased ($p \leq .05$). When we compared the year of study with reasons for not having a tattoo, we found a statistically significant difference between not having a tattoo due to medical reasons and the year of study ($p \leq .05$). The rate of not having a tattoo due to medical reasons decreased as the year of study increased. The rate of thinking that Hepatitis C virus can spread through dry blood increased as the year of study decreased and there is a significant difference between the years of study ($p \leq .05$) (Table 4).

When we compared having a friend, relative, and patient with HIV/AIDS, providing care and coming into contact with a person who is HIV/AIDS (+), receiving a Hepatitis B vaccine, being injured by a contaminated needle, and wearing gloves during invasive interventions in order to protect themselves with being anxious, we found no significant difference ($p > .05$).

Discussion

Sexually transmitted diseases (STDs) are the second major cause of unpleasant diseases in young adult women. Adolescents and young adults (15-24 years old) make up only 25% of the sexually active population, but represent almost 50% of all new acquired STDs. In general, STDs are a problem interest in health and economic consequences. High-risk sexual behavior is a highly contributive factor of this process as it often leads to teenage pregnancies and HIV/AIDS (Da Ros and da Silva Schmitt, 2008).

In Turkey, where a quarter of the population is aged between 15-24 years, 11.9% of HIV/AIDS notifications were observed in this age group by the end of 2012 (Turkish Republic Ministry of Health HIV/AIDS Data, 2012). According to our study findings, the mean age of the students was 21.25±3.11 and approximately 95% of our sample had no sexual experience. In Turkey, where 99,8% of the population are Muslims, it is known that various sociocultural groups (male/female, rural/urban areas, age, level of education), which differ in means of sexual attitudes and acts, display different characteristics (Cok et al., 2001; Aras et al., 2004). In Turkish studies conducted with university students, it was found that male students were more likely to accept having pre-marital sexual experiences compared to female students. The rate of males who had a pre-marital sexual experience is significantly higher than females (Aras et al. 2004; Askun, 2000; Pınar et al., 2009). Our study findings indicate that people who are in their 20's can responsibly engage in sexual acts. In addition, this result is satisfactory in means of preventing "sexually transmitted infections".

In 1991, the CDC made it compulsory for health personnel, which is an important risk group, to be vaccinated (CDC, 2004). With the decision taken by the I.U. Faculty of Health Sciences administration, Hepatitis B vaccination prior to clinical practice is compulsory for midwifery students. Therefore, the rate of receiving vaccines is high among students.

Table 1. Characteristics of the students (N=166)

		n	%
Year	1st year	53	31.9
	2nd year	43	25.9
	3rd year	38	22.9
	4th year	32	19.3
Age (Mean 21.25±3.11 years)	18-19 years	40	24.1
	20-21 years	67	40.4
	22-23 years	43	25.9
	24 years and more	16	9.6
Hepatitis B vaccine	Received	145	87.3
	Not received	21	12.7
Injured by a contaminated needle, etc.	Yes	41	24.7
	No	125	75.3
Did you have a patient with Hepatitis B or C or HIV/AIDS?	Yes	127	76.5
	No	39	23.5
Did you ever provide care for a person with Hepatitis B or C or HIV/AIDS?	Yes	110	66.3
	No	56	33.7
Did you come into contact with a person with Hepatitis B or C or HIV/AIDS?	Yes	76	45.8
	No	90	54.2
Would you feel anxious about providing care for a person with Hepatitis B or C or HIV/AIDS?	Yes	110	66.3
	No	56	33.7

Table 2. Applications and protective measures regarding sharps/needlestick injuries and thoughts about tattoos*

		n	**%**
When I am injured by a sharp object or needlestick;	I wash my hands.	30	18,1
	I use antiseptic/disinfectant.	21	12,7
	I apply a medical intervention.	55	33,1
	I consult an expert.	28	16,9
	I show emotional responses.	12	7,2
	No response	32	19.3
In order to protect myself during invasive interventions	I wear gloves.	125	75,3
	I work according to the aseptic technique.	10	6,0
	I apply universal precautions.	2	1,2
	Other	20	12,0
	No response	15	9,0
When my hands are contaminated by a patient's blood or bodily fluids	I wash them with water and soap.	121	72,9
	I wash them with antiseptic/disinfectant.	47	28,3
	I consult an expert.	3	1,8
	I take a test.	6	3,6
	No response	12	7,2
I would not have a tattoo because;	I have aesthetic concerns.	15	9,0
	It is against my religious beliefs.	34	20,5
	It carries medical risks.	41	24,7
	Due to familial/social pressure	3	1,8
	Due to personal reasons	70	42,2
	I would have a tattoo.	9	5,4
	No response	27	16,3

* More than one option was reported.

Table 3. Students' beliefs and thoughts about the contamination, treatment, and prevention of Hepatitis B or C or HIV/AIDS

Expressions	Yes		No		Unanswered	
	n	%	n	%	n	%
The rate of disease contamination is high among people who received a blood transfusion.	132	79.5	29	17.5	5	3
There is no definitive cure for AIDS.	141	84.9	23	13.9	2	1.2
Hepatitis C virus can even spread through dry blood.	91	54.8	64	38.6	11	6.6
Dental treatment dos not cause disease contamination.	6	3.6	158	95.2	2	1.2
Receiving vaccines is sufficient for protecting yourself from blood borne diseases.	31	18.7	131	78.9	4	2.4
I think people with HIV/AIDS act in a manner that justifies them getting infected.	6	3.6	156	94	4	2.4
People with HIV/AIDS should be treated at separate hospitals.	77	46.4	84	50.6	5	3
Sexual intercourse is the only way of transmitting HIV.	9	5.4	153	92.2	4	2.4
Substance users are the main carriers of diseases.	55	33.1	104	62.7	7	4.2
Mosquitos, flies, and ants can spread HIV.	70	42.2	89	53.6	7	4.2
Hepatitis or HIV spreads through organ transplantation.	136	81.9	23	13.9	7	4.2
HIV cannot be transmitted to the baby via breastfeeding when the mother is HIV positive.	25	15.1	133	80.1	8	4.8
Swimming in the same pool with a person who has HIV/AIDS can lead to disease contamination.	83	50	70	42.2	13	7.8
Using a condom does not suit an honorable man. (Using a condom is not culturally acceptable in the Turkish male society)	3	1.8	160	96.4	3	1.8
The HIV virus can persist in dry blood.	84	50.6	60	36.1	22	13.3
Protect						
I would not have a manicure or pedicure.	82	49.4	84	50.6	-	-
I would not drink from another person's glass.	67	40.4	99	59.6	-	-
I would not use another person's fork, spoon, knife, etc.	88	53	78	47	-	-
I do not go to the dentist.	8	4.8	158	95.2	-	-
I would not use the same soap.	38	22.9	128	77.1	-	-
I pray.	21	12.7	145	87.3	-	-
I would not receive a blood transfusion even if it is necessary for my treatment.	10	6	156	94	-	-
I use condoms during sexual intercourse.	74	44.6	92	55.4	-	-

Table 4. Comparison of year of study with students' thoughts about injuries, protection, and contamination *

		Class 1	Class 2	Class 3	Class 4	Totaly n	Totaly %	χ^2	p
I feel anxious when I provide care for a person with Hepatitis B, C or HIV/AIDS (+). (n=166)	Yes	40	32	21	17	110	66.3	7.81	0.05
	No	13	11	17	15	56	33.7		
I wash my hands when I am injured by a sharps / needlestick. (n=134)	Yes	7	9	5	9	30	22.4	4.23	0.238
	No	37	23	26	18	104	77.6		
I apply a medical intervention when I am injured by a sharps/needlestick. (n=134)	Yes	17	11	14	13	55	41.0	1.47	0.688
	No	27	21	17	14	79	59.0		
I wear gloves during invasive interventions in order to protect myself. (n=151)	Yes	40	27	33	25	125	82.8	3.74	0.290
	No	7	10	4	5	26	17.2		
When my hands are contaminated by a patient's blood and bodily fluids, I wash them with water and soap. (n=154)	Yes	36	33	28	24	121	78.6	1.67	0.643
	No	13	6	7	7	33	21.4		
I would not have a tattoo because it carries medical risks. (n=130)	Yes	11	18	8	4	41	31.5	12.13	0.007
	No	35	15	18	21	89	68.5		
I would not have a tattoo due to personal reasons. (n=130)	Yes	25	17	11	17	70	53.8	3.48	0.323
	No	21	16	15	8	60	46.2		
Hepatitis C virus can even spread through dry blood. (n=155)	Yes	31	29	15	16	91	58.7	8.74	0.03
	No	18	11	22	13	64	41.3		
People with HIV/AIDS should be treated at separate hospitals. (n=161)	Yes	24	20	18	15	77	47.8	0.133	0.988
	No	28	21	20	15	84	52.2		
Substance users are the main carriers of diseases. (n=159)	Yes	16	20	13	6	55	34.6	6.127	0.106
	No	34	22	24	24	104	65.4		
Mosquitos, flies, and ants can spread HIV. (n=159)	Yes	30	14	14	12	70	44.0	6.142	0.105
	No	22	26	24	17	89	56.0		
Swimming in the same pool with a person who has HIV/AIDS can lead to disease contamination. (n=153)	Yes	29	17	18	19	83	54.2	4.329	0.228
	No	19	21	20	10	70	45.8		
The HIV virus can persist in dry blood. (n=144)	Yes	25	26	16	17	84	58.3	5.146	0.161
	No	21	12	19	8	60	41.7		

* Questionnaires with missing responses were excluded from the comparisons. Therefore the number of n is different in each comparison.

According to World Health Organization (WHO) data, 3 million percutaneous injuries occur every year among the 35 million health personnel in the world. As a result, 70000 Hepatitis B virus (HBV), 15000 Hepatitis C virus (HCV), and approximately 1000 HIV infections occur every year (Girgin et al., 2009). Studies indicate that in injector injuries involving contact with Anti-HCV positive patient blood, the risk of Anti-HCV becoming positive is 1.8% (Aygun, 2007). In all percutaneous injuries, the risk of HIV transmission is 0.3% (Aygun, 2007). In the literature, it was determined that the incidence of Being Injured by Sharps/Needlestick (BISN) is 15% in Taiwanese students and 18% in Italian nursing students; whereas the BISN prevalence among nursing students is 24% in France, 30-33% in the US, 12-33% in the UK, 35% in

Singapore, and 29% in Australia (Korkmaz, 2008). Although there were no similar studies conducted with midwifery students, our study findings are parallel to the results of other studies conducted with nursing students.

In our study, 75% of the students stated that they wore gloves during invasive interventions for protection. Although wearing gloves does not protect against cutting tool injuries, it is one of the most important methods for avoiding contaminated blood and bodily fluids. Using gloves is strongly recommended in every intervention that carries a chance of exposure. Since latex gloves constitute a good barrier, the chances of becoming infected because of a wound forming from over the glove is lower. The inoculum amount of a syringe drops 10 to 100 times when it passes through a latex glove. Using double gloves reduces the chance of infection another 70% (Khamis at al., 2016).

In the literature, the number of years of professional experience is stated to be an indicator for needle injury incidence (Fullerton & Gibbons, 2011). The fact that nursing students have little experience when learning new skills increases the risk of injury (Smith & Leggat, 2005). In a study, nursing students were found to have a 50-80% rate of receiving cutting tool injuries during their training (Shiao et al. 2002). Midwifery students, like many other health care students, are inexperienced on many invasive applications. Thus, the risk of injury is higher, and students should know what to do after an injury. In our study, 33% of the student stated that they would apply medical interventions after an injury as one of their first few choices, among which would be having tests done and inoculation. According to the American Nurses Association's (ANA) Needlestick Prevention Guide - 2007 washing with soap and water and having HIV, Hepatitis B and Hepatitis C tests done are among the most immediate interventions that should be performed after a cutting tool injury (Korkmaz, 2008). The area of contact shouldn't be traumatized by squeezing, sucking or trying to bleed out (Girgin et al. 2009). In a study by Bozkurt et al, all of the health care personnel stated that they cleaned thee injury area with water or antiseptic solution after contact (Bozkurt et al, 2013). Nearly 73% of the students who participated in our study stated that they washed their hands with soap and blood after contact when a patient's blood or bodily fluids contacted their hands.

Wearing gloves during invasive applications is the foremost universal precaution against contamination. In our study, nearly 75% of the students stated that they wore gloves during invasive procedures for protection. In a study where the rate of using protective precautions was researched among health care employees, it was found that only 52% wore gloves, 5% used masks, 3% wore a protective shirt, and 2% used protective goggles (Akbulut, 2004)

Nearly 50% of the students who participated in our study had information on how Hepatitis B, C or HIV/AIDS spread. This ratio is worrisome. In studies on the subject, it was found that students thought HIV/AIDS could be contracted by social kissing, eating out of the same container, using the same fork, spoon, glass, or comb, using the same bathroom or bathtub, sneezing, or mosquito bites (Cornelius, 2006; Koc, 2013, Rehan et al, 2016). Thus, it is possible to state that students need information on how Hepatitis B, C, and HIV spread.

The HIV lives for a long time in blood and blood products. It is known to lose its transmissibility within 30 minutes in a non living environment (Aygun, 2007). The Hepatitis C virus, on the other hand, stays alive for 60 days in room temperature on blood and blood stain samples taken from an infected patient (Takasaka et al., 2011). The Hepatitis B virus is the biological agent with the highest transmission risk among viral hepatitis. The agent lives for a long time in blood and blood products. In dried blood at 25 degrees Celsius, it can stay alive for 7 days (Aygun, 2007). In external environments (non living tissue) it can stay alive for as long as 30 days. It is alive and transmissible on the human hand for as long as 4 hours (Goktas, 1997). In our study, nearly 50% of the students were found to be knowledgeable on the vitality periods of the Hepatitis C virus and HIV in non living environments. However, no meaningful relationship was found between the status of having knowledge on the vitality of the HIV and class levels ($p=0.161$). On the other hand, meaningful relationship was found between the status of having knowledge on the vitality of the Hepatitis C virus and class levels ($p=0.03$). These results make us consider that students get the information on HIV not in the school environment but from other learning tools.

In the literature, the levels of knowledge of university students regarding HIV/AIDS are

stated to be insufficient, and their attitudes are stated to be negative (Zeren, Alıcı & Ay, 2012). In our study, nearly 46% of the students stated that people with HIV/AIDS should be treated in separate hospitals, and 33% stated that they thought drug users are the main carrier of those diseases. According to those results, it can be said that even though those students study in the field of health care, they have some prejudiced and contradictory attitudes. As a result of the real and false fear that society has for HIV/AIDS, society becomes prejudiced and stigmatizes patients which makes living with HIV/AIDS harder for the patients and their relatives. Our findings show that this social prejudice has an effect on students.

Conclusion

Midwifery students, who are likely to come into contact with blood borne factors causing systemic infections, need information about protection, taking precautions, and ways of transmission. In the study, it was observed that the rate of receiving Hepatitis B vaccine is high among students, which is an important and satisfactory result. Although exposure to viral and contagious agents through sharps/needlestick injuries is mostly preventable, it was observed that protective measures other than wearing gloves were not applied. Most of the midwifery students have insufficient information regarding the necessary procedures to be conducted after exposure as well as standard precautions. It was determined that the students were especially affected by social prejudices regarding coming into contact with an HIV/AIDS (+) person, being friends with such a person or providing care for an infected patient and that they would feel anxious under such conditions. Informing midwifery students about protection against these factors, taking precautions, and ways of transmission would decrease their anxiety levels. For this purpose, it is recommended that the necessary modifications should be done in course content and educational curriculum and that awareness about the procedures and protocol regarding injuries should be increased.

Limitations of the study: The present study has some limitations. The first limitation is that our findings cannot be generalized to a group other than the midwifery students in the study. Secondly, this study was conducted in a big city, in one university, and only with midwifery students. Studies including midwifery students who live at different urban areas of Turkey and who have different socio-economic and educational backgrounds should be conducted.

References

Akbulut, A. (2004). Risk and prevention of infection in health personnel: Blood-borne infections. *Turkish Journal of Hospital Infections*, 8,132-139.

Altıok, M., Kuyurtar, F., Karacorlu, S., Ersoz, G., & Erdogan, S. (2009). Healthcare workers experiences with sharps and needlestick injuries and precautions they took when injuring. *e-Journal of Nursing Science & Art of Maltepe University*, 2, 70-79.

Aras, S., Orcın, E., Ozan, S., & Semin, S. (2004). Sexual attitudes and behaviors of students of Dokuz Eylul University. *Health and Society Magazine*, 14, 78-87.

Askun, D. (2000). A review of the sexual attitudes and behaviors of Turkish university students: A cultural perspective on gender differences. (Unpublished Master's Thesis). Clinical Psychology, Bogazici University, Istanbul.

Aygun, P. (2007). Cutter-drill tool injuries and protection measures. *5th National Sterilization and Disinfection Congress Book*. Istanbul, pp. 385-390.

Bozkurt, S., Kokoglu, O.F., Yanıt, F., Kocahasanoglu, U., Okumus, M., Sucaklı, M.H., et al. (2013). Needle sticks and injuries due to surgical instruments in health care providers. *Dicle Med J.* 40, 449-452.

Centers for Disease Control and Prevention, (2004). Workbook for designing, implementing and evaluating a sharps injury prevention program. Available from: <http:// www.cdc.gov / sharpsafety / pdf /> (Acces 15 -11-2013)

Center of Disease Control and Prevention, (CDS) (2017). The National Institute for Occupational Safety and Health (NIOSH) report. Available from: https://www.cdc.gov/niosh/stopsticks/sharpsinjuries.html (Acces 15-3- 2017)

Cornelius, J.B. (2006). HIV-Related knowledge, attitudes, and perceived risk of exposure of african-american nursing students from a high prevalence AIDs area. *Journal of Multicultural Nursing & Health*, 12, 41-50.

Cok, F., Gray, L.A., & Ersever, H. (2001). Turkish university students' sexual behaviour, knowledge, attitudes and perceptions of risk related to HIV/AIDS. *Culture, Health & Sexual*, 3, 81- 99.

Da Ros, C. T., & da Silva Schmitt, C. (2008). Global epidemiology of sexually transmitted diseases. *Asian Journal of Androl*, 10(1), 110-114.

Fullerton, M., & Gibbons, V. (2011). Needlestick injuries in a healthcare setting in New Zealand. *N Z Med J.* 124, 33-39.

Girgin, S., Temiz, H., Gedik, E., & Gul, K. (2009). Preoperative Seroprevalence of HBsAg, Anti-

HCV, Anti-HIV in general surgery patients *Dicle Med J*. 36, 283-287.

Goktas, P. (1997). 200 Ask Viral Hepatitis Handbook. Gelisim Tıp Laboratuvarı Yayınları – 7. Ful Ajans Yapım ve Tanıtım Hizmetleri A.S., Istanbul, p:38.

Khamis, A. A. G., Jacoub, A. O., Suleiman, S. H., & Fahal, A. H. (2016). Knowledge, attitudes and practices of surgical staff at Khartoum State hospitals towards Hepatitis B infection. Khartoum Medical Journal, 7, 932-940.

Koc, A. (2013). Nurses level of knowledge on the human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), behavior and practices: A survey from Turkish Society. *Journal of AIDS and HIV Research*, *5*(2), 27-33.

Korkmaz, M. (2008). Health care workers are injured by penetrating cutting tools. *Fırat Health Care Magazine*, 3, 17-37.

Pınar, G., Dogan, N., Okdem, S., Algıer, S., & Oksuz, E. (2009). Knowledge, attitudes and behavior of students related to sexual healthin a private university. *Archive of Medical Investigations*, 7, 105 -113.

Puro, V., De Carli, G., Cicalini, S., Soldani, F., Balslev, U., Begovac, J., Boaventura, L., Campins Martí, M., Hernández Navarrete, M.J., Kammerlander, R., Larsen, C., Lot, F., Lunding, S., Marcus, U., Payne, L., Pereira, A.A., Thomas, T., Ippolito, G. (2005). European recommendations for the management of healthcare workers occupationally exposed to hepatitis B virus and hepatitis C virus. *Euro Surveill*, 10, 260-264.

Rehan, M., Waheed, U., Sarwar, M., Arshad, M., Satti, H. S., & Zaheer, H. A. (2016). Knowledge, Attitude, Practices and Awareness Regarding HIV/AIDS among University Students of Islamabad and Rawalpindi, Pakistan. *Ann. Pak. Inst. Med. Sci*, 12, 89-92.

Shiao, J.S., Mclaws, M.L., Huang, K.Y., & Guo, Y.L. (2002). Student nurses in taiwan at high risk for needlestick ınjuries. *Ann Epidemiol*. 12, 197-201.

Smith, D.R., & Leggat, P.A. (2005). Needlestick and sharps injuries among nursing students. *J Adv Nurs.* 51, 449-455.

Takasaka, T., Itoh,Y., Kaneko,H., & Ikegaya, H. (2011). Detection of hepatitis C virus and antibodies in postmortem blood and bloodstains. *J. Clin. Microbiol.* 43, 1122–1123.

Turkish Republic Ministry of Health HIV/AIDS Data, 2012. HIV / AIDS Data, General Directorate of Primary Health Care Services, Department of Communicable Disease Control, Department of Venereal Diseases., Ankara.

Tuzun, H., İlhan, F., Ceyhan, M.N., & Maral, N. (2005). Knowledge and attitudes of family medicine faculty first year students on family planning and sexually transmitted diseases. *Medical Journal*, 2, 197-203.

Zeren, S.G., Alıcı, D., & Ay, F., (2012). Nursing students' attitudes towards HIV/AIDS: Agrı, Istanbul and Mersin samples from Turkey. *Education in Medicine Journal*, 4, 77-85.