EVALUATION OF APPROACHES OF NURSING STUDENTS TO OCCUPATIONAL HEALTH AND SAFETY

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ABSTRACT

This research was carried out to evaluate the approach to the occupational health and safety of nursing students who are educated at Department of Nursing - Sinop University School of Health. The research which is descriptive was carried out between May-June 2016 with 304 nursing students who accepted to participate to the research. The research data was obtained from a questionnaire with totally 25 questions prepared by the researchers, including questions about socio-demographic characteristics, questions about legislation related to occupational health and safety, questions about occupational health and safety related professional approaches. In the findings of this research, it was found that the relationship between the classes in which the nursing students are being educated and given answers to some questions which evaluate occupational and legislative approaches to occupational health and safety is significant ($p < 0.05$) and according to the ANOVA test, the difference between these questions and the classes is significant ($p < 0.05$) and according to Tamhane's T2 test, it was determined that this difference increase according to class grade. As a result of this research, it has been determined that nursing students have very knowledgeable, positive and gratifying approaches intended for protecting the health of themselves and patients / healthy individuals in terms of occupational health and safety. In addition, due to the risks related to occupational health and safety that may be encountered in working conditions, in order to draw their attention and reinforce their knowledge it may be suggested to place occupational health and safety related courses into their curriculum.

Keywords: *Occupational health and safety, nursing, education*

INTRODUCTION

The concept of Occupational Health and Safety is defined as 'systematic and scientific studies carried out in order to protect from harmful situations that may arise due to various reasons during work at work places' (Dizdar, 2002). Every workplace has a variety of hazards that vary according to work done in terms of health and safety. Hospitals that are in complex socio-technical institutions and

that have many business lines together in the health sector are considered as one of the high-risk business sectors. In fact, hospitals are workplaces where electrical and electronic devices are more often used, where chemical and radioactive materials are expended for many processes, where heavy materials are transported, and where materials with a risk of bioinfection and cutting/drilling tools are frequently used (Parlar, 2008). For this reason, the hospitals were evaluated in the category of "Very dangerous workplace" in the Notification of Workplace Hazard Classes Concerning Occupational Health and Safety published by the Ministry of Labor and Social Security (MoLSS) in 2012 (resmi gazete, 2012, Solmaz and Solmaz, 2017).

The dangers and risks that affect the health of health workers have generally grouped under five groups and it has been reported that there are various risk factors which are 29 physical, 25 chemical, 24 biological, 6 ergonomic and 10 psychosocial at hospitals by NIOSH in 2005 (NIOSH, 2005; Özkan and Emiroğlu, 2006). However, the likelihood of encountering occupational risk factors of health professionals differs according to the occupation and the department that they work (Samancıoğlu et al., 2013, Doğan and Sözen, 2016, Yıldırım and Gerdan, 2017). The studies indicate that the likelihood of encountering health risks of nurses higher than other health care providers because they are responsible of the direct care of the patients (Parlar, 2008; Altıok et al., 2009; Demir, 2013; Akgün, 2015; Solmaz and Solmaz, 2017). Also, other studies have shown that the majority of the occupational accidents and occupational diseases are caused by the insecure activities of employees and factors such as undisciplined behavior, uneducatedness, excessive and irregular working hours are among the extensive causes. (Rikhardsson and Impgaard, 2004; Bahçecik and Öztürk, 2009; Meydanlıoğlu, 2013).

While considering the risks related to occupational health and safety that nursing students will encounter in the course of their practice in the hospital or in their professional lives, it is foreseen that occupational accidents can be reduced by paying attention to these risks and the precautions to be taken. In order to prepare the students during their education course for their occupational life and to predict the hazards that they may encounter in their professional lives, it is necessary for them to take into consideration the hazard identification, risk identification, risk control and warning signboards in their working areas. This research was planned as a descriptive study for evaluating the approach to the occupational health and safety of the nursing students who are educated at Sinop University School of Health.

MATERIAL AND METHOD

The research was descriptive and was conducted between May and June 2016 to nursing students being educated at the Sinop University School of Health. All of the students being educated in the nursing department has formed the universe of the research (n = 367) and the entire universe were included in the sampling group. 98 male and 206 female students who agreed to participate to the

research have formed the sample of the research. The students who were willing to join to the research were evaluated within the scope of the research.

Data Collection

The research data was obtained from a questionnaire with totally 25 questions prepared by the researchers, including questions about socio-demographic characteristics, questions about legislation related to occupational health and safety, questions about occupational health and safety related professional approaches. By the researchers the questionnaires were distributed to the sampling group, it was requested to fill out them, and then collected immediately.

Data Analysis

The research data were analyzed by using descriptive statistics, percentiles, Chi-square, ANOVA and Tamhane's T2 tests with SPSS 21.0 package program.

Research Limitations

The fact that the number of male students is less than that of female students is the limit of the research.

Ethics of Research

In terms of research ethics, ethics committee approval dated 06.06.2016 and numbered 2016-18 was taken from the Ethics Committee of Sinop University Human Research Council, the written permission for the purpose of collecting the data by the Director of Sinop University School of Health and the written approval were obtained from the students who will participate to the research.

RESULTS

Demographic characteristics and distribution of working conditions of students participating to the research are given in Table 1.

Table 1. *Demographic characteristics and distribution of working conditions of students participating to the research (n=304)*

Features		n	%
Gender	Males	98	32.2
	Females	206	67.8
Age	18≤age≤20	140	46.1
	21≤age≤24	153	50.3
	25≤age≤32	11	3.6
Class	1th class	88	28.9
	2th class	85	28.0
	3th class	72	23.7
	4th class	59	19.4
Working in any job currently	Yes	19	6.3
	No	285	93.8
Work previously in any job	Yes	134	44.1
	No	170	55.9

A total of 304 nursing students (67.8% of them are female and 32.2% of them are male) participated to the research. (Table 1). The average age of the students who participated to the research was 21 ± 0.12 (min.18-max.32) and 28.9% of them were 1st class, 28% of them were 2nd class and 23.7% of them were 3rd class students. From the 4th class students only 59 students (19.4%) have participated to the survey research. It was determined that 6.3% of the students who participated to the research answered as "working in any job currently", at the same time 44.1% of them answered as "they have never worked in any job before".

The encounter situations related to occupational health and safety term of nursing students are shown in Table 2.

Table 2. *Encounter condition to the occupational health and safety term of the students participating to the research (n=304)*

		n	%
Have you encountered before with the Occupational Health and Safety term?	Yes	251	82.6
	No	53	17.4
If your answer is 'yes', where did you encounter?	During nursing education	110	43.82
	Media	58	23.11
	Internet	30	11.95
	At the workplace	22	8.76
	Other (family members, friends, high school)	31	12.35

The encountering rate with occupational health and safety term of nursing students participated to the research was determined as 82.6%. From the given answers, 43.82% of them reported that they encountered during nursing education, 23.11% of them encountered from the media, 11.95% of them encountered from the internet and 8.76% of them encountered in the workplace and 12.35% of them encountered mostly during high school education, from friendship or family members.

Table 3. *The distribution of occupational approaches about the occupational health and safety of the students participating to the research (n=304)*

Occupational Approaches		**n**	**%**
The status of necessity to have a legislation on occupational health and safety in the workplace which you will work in the future	Yes	301	99.0
	No	3	1.0
The status of considering suitable to close the needle cover after injection to the patient	Yes	203	66.8
	No	101	33.2
The status of thinking necessary to wear gloves while making the patient care	Yes	303	99.7
	No	1	0.3
The status of thinking necessary to wear an apron while entering into an AIDS patient's room for oral care	Yes	269	88.5
	No	35	11.5
The status of thinking necessary to wear an apron, a mask and gloves while entering into an active tuberculosis patient's room for oral care	Yes	301	99.0
	No	3	1.0
The status of finding suitable to go to the close circle of hospitals with the shoes worn in the hospital when needed	Yes	71	23.4
	No	233	76.6

The status of finding needful to change the gloves when passing from one patient to another	Yes	302	99.3
	No	2	0.7
The status of thinking to expose to physical and verbal violence by the patient's relatives in the hospitals is within occupational health and safety	Yes	269	88.5
	No	35	11.5
When the chemical substance splashes into the skin, eyes and open wound, status of thinking that washing the area in 10 min. is important	Yes	291	95.7
	No	13	4.3
The status of thinking unnecessary to dry with a paper towel after hand washing in the hospital environment	Yes	131	43.1
	No	173	56.9

Table 4. *Evaluation of legislative approaches of students participated to the research to occupational health and safety*

Legislative Approaches to Occupational Health and Safety.		**n**	**%**
The evaluation status of the medical waste bag colours	Yellow	17	5.6
	Red	279	91.8
	Blue	2	0.7
	Black	6	2.0
The determination status of the code used as emergency management tool when the hospital employees and the patients or patient's relatives encounter with the cases of physical and verbal violence	Red Code	127	41.8
	Blue Code	40	13.2
	White Code	115	37.8
	Yellow Code	22	7.2
The status of thinking which method is the most effective approach for protecting against occupational diseases	Control of hazard at source	55	18.1
	Using personal protective equipment	89	29.3
	Job entrance medical examination and periodic health checks	37	12.2
	Occupational health training	123	40.5
The status of thinking which method is the most benefit method for protecting against occupational lung diseases due to dust	Use of dust mask	152	50.0
	Reduce number of employees	3	1.0
	Pulmonary filming at intervals, sputum testing.	29	9.5
	Dust control applications in job environment	120	39.5
The status of determination of signboard meanings which are specified for hospital safety respectively	Radioactive substance - Strong magnetic field - Unauthorized person can not enter	183	60.2
	Other combinations	121	39.8
The status of expressing true of the meaning of ILO term	International Labour Security Organization	241	79.3
	International Labour Organization	29	9.5
	International Common Health and Safety Unit	25	8.2
	World Health Organization	9	3.0
The status of expressing true of the meaning of EU-OSHA term	European Human Health and Security Organization	109	35.9
	European Occupational Safety and Health Agency	90	29.6
	European Occupational Safety Supervision Agency	45	14.8
	European Occupational Health and Safety Unit	60	19.7
Information considered appropriate primarily while patient identification	Patient history	235	77.3
	Physical examination	17	5.6
	Radiological results	9	3.0
	Laboratory results	43	14.1

The distribution of occupational approaches related to occupational health and safety of the students participated to the research is given in Table 3. It has been determined that 99.7% of the students have given the answer of "it is

necessary" to the question of "the status of thinking necessary to wear gloves while making the patient care".

The evaluation of the approach to legislative in occupational health and safety of the students participated to the research is given in Table 4. It was found that 91.8% of the respondents answered as 'red' to the question of "the evaluation status of the medical waste bag colours" regarding the colors of medical waste bags. It was determined that 77.3% of the respondents answered as "getting patient history" to the question of "information considered appropriate primarily while patient identification". It was determined that 60.2% of respondents answered as "radioactive substance-strong magnetic field-Unauthorized person can not enter" to the question of "the status of determination of signboard meanings which are specified for hospital safety respectively" (Table 4). However, it was determined that 41.8% of the students answered as "red code" and 37.8% of the students answered as "white code" to the question of "the determination status of the code used as emergency management tool when the hospital employees and the patients or patient's relatives encounter with the cases of physical and verbal violence" about the code used as the emergency management tool during the direction to the scene of accident of the security personnel (Table 4).

During the research, it was determined that 40.5% of the students preferred the answer of "occupational health training" and 18.1% of the them answered as "control of hazard at source" to the question of " the status of thinking which method is the most effective approach for protecting against occupational diseases?" (Table 4). It was determined that 50% of the students who participated to the research answered as "use of dust mask" to the question of " the status of thinking which method is the most benefit method for protecting against occupational lung diseases due to dust", in which the most effective approach to protect against occupational lung diseases due to dust was asked.

In the questions of the meaning of the terms used in the legislation on occupational health and safety, 79.3% of the respondents answered as "International Labor Security Organization" to the question of "the status of expressing true of the meaning of ILO term " (Table 4). However, it was determined that 35.9% of the respondents answered as "European Human Health and Security Organization" to the question of " the status of expressing true of the meaning of EU-OSHA term".

Table 5. *The status of the relationship between "the classes in which they are being educated" and "the answers given to occupational approaches about the occupational health and safety" of the nursing students participated to the research.*

		1th. Class n=88 n (%)	**2th. Class n=85 n (%)**	**3th Class n=72 n (%)**	**4th Class n= 59 n (%)**	**X^2**	**p**
The status of considering suitable to close the needle cover after injection to the patient	**True**	26 (%29.5)	17 (%20.0)	28 (%38.9)	30 (%50.8)	16.538	p<0.05
	False	62 (%70.5)	68 (%80.0)	44 (%61.1)	29(%49.2)		

The status of thinking necessary to wear an apron while entering into an AIDS patient's room for oral care	**True** **False**	10 (%11.4) 78 (%88.6)	17 (%20.0) 68 (%80.0)	5 (%6.9) 67 (%93.1)	3 (%5.1) 56 (%94.9)	9.880	p<0.05
The status of finding suitable to go to the close circle of hospitals with the shoes worn in the hospital when needed	**True** **False**	61 (%69.3) 27 (%30.7)	60 (%70.6) 25 (%29.4)	63 (%87.5) 9 (%12.5)	49 (%83.1) 10 (%16.9)	10.473	p<0.05
The status of thinking to expose to physical and verbal violence by the patient's relatives in the hospitals is within occupational health and safety	**True** **False**	71 (%80.7) 17 (%19.3)	77 (%90.6) 8 (%9.4)	64 (%88.9) 8 (%11.1)	57 (%96.6) 2 (%3.4)	9.464	p<0.05

When the the status of the relationship between “the classes in which they are being educated” and “their answers to the questions in which vocationally approaches to occupational health and safety are assessed” of nursing students participated to the research is examined, it was identified that the relationship between the classes in which nursing students are being educated and their answers to four questions (the status of considering suitable to close the needle cover after injection to the patient, the status of thinking necessary to wear an apron while entering into an AIDS patient's room for oral care, the status of finding suitable to go to the close circle of hospitals with the shoes worn in the hospital when needed, the status of thinking to expose to physical and verbal violence by the patient's relatives in the hospitals is within occupational health and safety) was significant (p<0.05) (Table 5). On the other hand, it was determined that the relationship between the classes in which nursing students are being educated and their given answers to the other questions was insignificant (p>0.05).

Table 6. *The status of the differences between "the classes in which they are being educated" and ‘the answers given to occupational approaches about the occupational health and safety’ of the nursing students participated to the research*

		1thClass n=88	**2th Class n=85**	**3th Class n=72**	**4th Class n= 59**	**F**	**p**
The status of considering suitable to close the needle cover after injection to the patient	**True** **False**	26 62	17 68	28 44	30 29	5.753	0.001
Tamhane’s T2	**2th Class**				**p=0.001**		
The status of thinking necessary to wear an apron while entering into an AIDS patient's room for oral care	**True** **False**	10 78	17 68	5 67	3 56	3.359	0.019
Tamhane’s T2	**2th Class**				**p=0.03**		
The status of finding suitable to go to the close circle of hospitals with the shoes worn in the hospital when needed	**True** **False**	61 27	60 25	63 9	49 10	3.568	0.015
Tamhane’s T2	**1th Class** **2th Class**			**p=0.027** **p=0.049**			

The status of thinking to expose to physical and verbal violence by the patient's relatives in the hospitals is within occupational health and safety	**True** **False**	71 17	77 8	64 8	57 2	3.213	0.023
Tamhane's T2	**1th Class**				**0.008**		

According to ANOVA test result made to determine whether there is a difference between the answers given to occupational approaches about the occupational health and safety and the classes in which the nursing students are being educated; the difference between the classes in which nursing students are being educated and their answers to four questions (the status of considering suitable to close the needle cover after injection to the patient, the status of thinking necessary to wear an apron while entering into an AIDS patient's room for oral care, the status of finding suitable to go to the close circle of hospitals with the shoes worn in the hospital when needed, the status of thinking to expose to physical and verbal violence by the patient's relatives in the hospitals is within occupational health and safety) was identified as significant ($p<0.05$) (Table 6). Also, according to Tamhane's T2 test, this difference was identified to be significant ($p<0.05$) and it has been found that this difference increases as the class level progresses. On the other hand, it was determined that the relationship between the classes in which nursing students are being educated and their given answers to the other questions was insignificant ($p>0.05$).

Table 7. *The status of the relationship between "the classes in which they are being educated" and "the answers given to legislative approaches about occupational health and safety" of the nursing students participated to the research*

		1th Class n=88 n (%)	**2th Class n=85 n (%)**	**3th Class n=72 n (%)**	**4th Class n= 59 n (%)**	**X^2**	**p**
The evaluation status of the medical waste bag colours	**True** **False**	70 (%79.5) 18 (%20.5)	81(%95.3) 4 (%4.7)	69 (%95.8) 3 (%4.2)	59 (%100) 0 (%0)	25.693	p<0.05
The status of expressing true of the meaning of ILO term	**True** **False**	5 (%5.7) 83 (%94.3)	3 (%3.5) 82 (%96.5)	6 (%8.3) 66 %91.7)	15 (%25.4) 44 (%74.6)	22.447	p<0.05
Information considered appropriate primarily while patient identification	**True** **False**	54 (%61.4) 34 (%38.6)	71 (%83.5) 14 (%16.5)	63 (%87.5) 9 (%12.5)	47 (%79.7) 12 (%20.3)	19.074	p<0.05
The determination status of the code used as emergency management tool when the hospital employees and the patients or patient's relatives encounter with the cases of physical and verbal violence	**True** **False**	10 (%11.4) 78 (88.6)	24 (%28.2) 61 (%71.8)	33 %45.8) 39 %54.2)	48 (%81.4) 11 (%18.6)	79.024	p<0.05

When the the status of the relationship between "the classes in which they are being educated" and "their answers to the questions that evaluate the approaches to occupational health and safety legislation" of nursing students participated to the research is examined, the relationship between the classes in which nursing students are being educated and answers that they gave for four questions (the evaluation status of the medical waste bag colours, the status of expressing true of the meaning of ILO term, information considered appropriate

primarily while patient identification, the determination status of the code used as emergency management tool when the hospital employees and the patients or patient's relatives encounter with the cases of physical and verbal violence) was identified as significant ($p<0.05$) (Table 7). On the other hand, it was determined that the relationship between the classes in which nursing students are being educated and their given answers to the other questions was insignificant ($p>0.05$).

Table 8. *The status of the differences between "the classes in which they are being educated" and "the answers given to legislative approaches about the occupational health and safety" of the nursing students participated to the research*

		1th Class n=88	2th Class n=85	3th Class n=72	4th. Class n= 59	F	p
The evaluation status of the medical waste bag colours	**True**	70	81	69	59	9.232	**0.001**
	False	18	4	3	0		
Tamhane's T2	**1th Class**		**p=0.010**	**p=0.007**	**p=0.001**		
The status of expressing true of the meaning of ILO term	**True**	5	3	6	15	7.973	**0.001**
	False	83	82	66	44		
Tamhane's T2	**1th. Class**				**p=0.013**		
	2th Class				**p=0.003**		
Information considered appropriate primarily while patient identification	**True**	54	71	63	47	6.695	**0.001**
	False	34	14	9	12		
Tamhane's T2	**1th Class**		**p=0.006**	**p=0.001**			
The determination status of the code used as emergency management tool when the hospital employees and the patients or patient's relatives encounter with the cases of physical and verbal violence	**True**	10	24	33	48	35.126	**0.001**
	False	78	61	39	11		
Tamhane's T2	**1th Class**		**p=0.032**	**p=0.001**	**p=0.001**		

According to ANOVA test made to determine whether there is a difference between given answers to the questions that evaluate the approaches to occupational health and safety legislation and the classes in which the nursing students are being educated; the difference between the classes in which nursing students are being educated and the answers that they gave for four question (the evaluation status of the medical waste bag colours, the status of expressing true of the meaning of ILO term, information considered appropriate primarily while patient identification, the determination status of the code used as emergency management tool when the hospital employees and the patients or patient's relatives encounter with the cases of physical and verbal violence) was identified as significant ($p<0.05$) (Table 8). Also, according to Tamhane's T2 test, this difference was identified as significant ($p<0.05$) and it has been found that this difference increases as the class level progresses. On the other hand, it was determined that the relationship between the classes in which nursing students

are being educated and their given answers to the other questions was insignificant ($p>0.05$).

DISCUSSION

This research was carried out to evaluate the approach to the occupational health and safety for 304 nursing students (98 participants are male and 206 participants are female) who are being educated at the Sinop University School of Health, and at the end of the research, also the answers to the questions related to the legislation about occupational health and safety and their professional approaches were evaluated separately; and the relations between their answers and the classes in which they are being educated was assessed.

In this research, it has been determined that 99.7% (highest rate) of the nursing students answered correctly to the question of " the status of thinking necessary to wear gloves while making the patient care" and following this rate, 99.3% of the them answered correctly to the question of " the status of finding needful to change the gloves when passing from one patient to another" (Table 3). Also according to this research results, it was determined that 99% of the participants gave the correct answer to the question of “the status of thinking necessary to wear an apron, a mask and gloves while entering into an active tuberculosis patient's room for oral care” was, but 11.5% of them (which is the least ratio among the others) gave the correct answer to the question of “the status of thinking necessary to wear an apron while entering into an AIDS patient's room for oral care”. At the same time, it has been detected that answer of "necessary" was given usually (56.9% of the participants) to the question (related to hygiene measures to be taken against occupational diseases) of “the status of thinking unnecessary to dry with a paper towel after hand washing in the hospital environment”. On the other hand, it has been stated that the question of “the status of finding suitable to go to the close circle of hospitals with the shoes worn in the hospital when needed” were answered as “should not go” with the ratio of 76.6%. Nevertheless, due to the sensitivity of the subject, it is suggested that it would be favorable to pay attention to the hygiene requirements of the nursing students for protecting their individual and environmental health. It is known that there are biological risk factors in all areas of health and due to contact with blood or infected body fluids, health workers can be infected (Wilburn and Eijkemans, 2004; Akgün, 2015; Büyük et al., 2016). For this reason, Solmaz and Solmaz (2017) are stated that in terms of occupational health and safety for reduction of exposure to biological risk factors in hospitals, the first thing to do is to take protective measurement in order to reduce the exposure to biological risk factors in hospitals; or is suggested that when the exposure is not preventable, the usage of personal protective equipment such as masks, goggles, face protectors, aprons, gloves is so important. However, according to another research to determine the prevalence of protective equipment usage of health personnel in order to prevent occupational diseases, Öztürk et al. (2015) reported that employees often used protective gloves and protective masks, but other protective equipment such as lead shirts and safety goggles are used sometimes and their attitudes towards

protective usage are generally negative. Similarly, Kişioğlu et al. (2002), in the study that is conducted with a total of 450 people consisting of research assistants, nurses, medical school senior students, health and cleaning personnel, they were reported that 52.4% of the research group gave the answer of "always they use gloves" and 53.1% of the research group gave the answer of "always they change gloves while passing from one patient to another". However, Altıok et al. (2009) reported that as the working time of health workers increase, the rate of wearing gloves decreases. For these reasons, the result of this research set thinking that during patient care, in terms of occupational health and safety, it is important to gain a behaviour of taking protective measures against occupational diseases and using of personal protective equipment for the nursing students.

During this research, it was determined that 33.2% of nursing students who participated to the research gave a correct answer to the question of "the status of considering suitable to close the needle cover after injection to the patient" that has great importance in terms of occupational health and safety (Table 3). However, the investigations have shown that injuries caused by cutting-piercing tools increase the risk of infectious infection and that most of the percutaneous injuries occur in the course of piercing with needle accidentally during or the end of the treatment, closing the needle after the end of treatment, disposing of medical waste and throwing to the waste box (Ayrancı and Kosgeroğlu, 2004; Kişioğlu et al., 2002; Altıok et al., 2009, Irmak and Baybuga, 2011; Samancıoğlu et al., 2013; Mangırlı and Özşaker, 2014; Doğan and Sözen, 2016; Büyük et al., 2016; Karataş et al., 2016). Similarly, Altıok et al. (2009) conducted a research with a total of 956 health personnel that agreed to participate to the research who are working at two universities, two state hospitals, and 54 health centers in Mersin province. In this study, the researchers stated that 83% of nurses/midwife exposured to injuries by cutting-piercing tools and 23.9% (181 people) of them got injured while "closing the needle cover", 21.2% (160 people) of them got injured while "seperate the needle from the injector", 15.3% of them got injured while "throwing to the waste box" and 12.8% (97 people) of them got injured while "accidentially in the course of holding in colleague's hand" during their experiences. Also they found that working health personnel were under considerable risk due to infection-related diseases. As a matter of fact, it is reported that the most effective way to protect the health of healthcare workers from blood-borne diseases is to prevent the case of injector sinking by Willburn and Eijkemans (2004). Therefore, in terms of occupational health and safety, the best way to prevent percutaneous injuries is to throw them into punctureproof infected boxes without closing needle tips after treatment (Büyük et al., 2016; Yazar et al., 2016; Doğru and Akyol, 2018). For these reasons, it should be reminded to nursing students during their education before their professional life frequently that the needle should not be closed after the treatment in order to protect their health to prevent the risk of infectious infection. It is considered that it is extremely important for nursing students to gain this behaviour before graduation in terms of occupational health and safety.

In the literature, it is stated that health workers are exposed to a variety of chemical hazards. (Meydanlıoğlu, 2013; Akgün, 2015; Solmaz and Solmaz, 2017). However, the exposure of the chemical substance to the skin for health workers is

only one of the risks leading to exposure to the chemical substance, and also workers can also be exposed to chemical substances in various ways such as oral, respiration, or cutting-penetrating injury (Akgün, 2015; Solmaz and Solmaz, 2017). It has been reported in researches done that 299 chemical substances is used in variaty types of dust, vapor, gas and liquid forms that may cause harm to human health, may cause dermatitis and work-related asthma in health institutions; there are disinfectants, sterilized agents, anesthetic gases and medicines among the chemical hazards and risks encountered by health care workers; and if essential precautions are not taken, exposuring to chemical hazards may cause negative effects on health (Wilburn and Eijkeman, 2004; Bayhan, 2005; Akgün, 2015, Solmaz and Solmaz, 2017). Also, Öztürk et al. (2015) have reported from the research conducted on 156 health personnel that employees are most frequently exposed to formaldehyde and ethyleneoxy exposure risks and that health personnel are rarely at risk of exposure to anesthetic gases. Investigations have emphasized that the effect of chemical hazards changes related to property, density, exposure time and exposure shape of chemical substance (Akgün, 2015; Akarsu and Güzel, 2016). In this research conducted at Sinop University School of Health, it was determined that the answer of “important” was given at the ratio of 95.7% of the participants to the question of “when the chemical substance splashes into the skin, eyes and open wound, status of thinking that washing the area in 10 min. is important” which is one of the measures taken in case of exposure to chemical hazards. In this study, it was found very gratifying of nursing students to know the most appropriate behavior after exposure to chemical substances.

One of the occupational and health problems that nurses encounter in their workplace is the violence that they are exposed to by patients, relatives, caretakers, or other individuals and these problems occur as verbal, physical assault, harassment, bullying, intimidation and threats (Ayrancı et al., 2002; Camerino et al., 2008; Gökçe and Dündar, 2008; Coşkun and Öztürk., 2010; Uğurlu et al., 2010; Kahriman, 2014; Akgün, 2015). It has been reported by various researchers that nurses mostly expose to the verbal and the physical violence in the workplaces and when the most of the health personnel working in our country are thought to be female, they met harassment incidents in working environments (Kwok et al., 2006; Shoghi et al., 2008; Demir, 2013). The Emergency Call System "White Code Response" (staff security) was established in Turkey in 2011 to prevent health personnel from being exposed to violence at workplaces and to ensure employee safety and it has been rearranged (White Code Instructions, 2013) in 2013 (Kazandere, 2016). However, in this study, it was determined that 37.8% of the students gave the answer of "white code"to the question of “determination status of the code used as emergency management tool when the hospital employees and the patients or patient’s relatives encounter with the cases of physical and verbal violence” in which the code is asked as an emergency management tool used for directing security personnel to the scene of security in terms of occupational health and safety (Table 4). It is believed that as the reason to get this answer as this ratio is only 19.4% of the total participants who agreed to participate to the research create the fourth-grade students and also information on this topic can be used entirely for the final grade students. It is also estimated

that the reason to get less correct answers to this question is likely to result in students being not to expose to situations that require using of this code or to prefer the abbreviated usage of it more practically (Table 1). However, it was considered as a very positive situation in terms of knowledge accumulation of giving the correct answer to the emergency codes substantially of the 4th class students in the last class of the learning process (Table 9). At the same time, it was found very gratifying to answer with the ratio of 88.5% as "within the occupational health and safety" of the nursing students to the question of "the status of thinking to expose to physical and verbal violence by the patient's relatives in the hospitals is within occupational health and safety". Also, it was determined that information which they get during their education in their job life as an indication they will be ready according to occupational safety.

During this research, it was determined that students answered with the ratio of 77.3% correctly to the question of "information considered appropriate primarily while patient identification", but students with the ratio of 18.1% answered correctly to the other question of "the status of thinking which method is the most effective approach for protecting against occupational diseases" (Table 4). At the same time, in this research, 50% of the students who participated in the research were given the answer as "use of dust mask" to the question of "the status of thinking which method is the most benefit method for protecting against occupational lung diseases due to dust", following that, it was determined that 39.5% of the students answered as "dust control applications in job environment". In researches conducted, it has been reported that for the prevention from occupational accidents when occupational accidents are not available yet, the control of hazard at the source and then doing ergonomic designs to minimize the risks of working systems and using of personal protective equipment are of great importance (Solmaz and Solmaz, 2017; Yıldırım and Gerdan, 2017). As a result of this research, it is estimated that the attitudes of the nursing students are positive to this issue.

In this research conducted with nursing students, getting the answer of "necessary" from the the students with the ratio of 99% to the the question of "the status of necessity to have a legislation on occupational health and safety in the workplace which you will work in the future" is an extremely important data that can be evaluated positively. This obtained data was evaluated as gratifying when it is considered that, the individuals with high awareness will get into business life in terms of occupational health and safety due to having a this kind of evaluation of nursing students before their work life. Besides, during the research, it was determined that the 79.3% of the participants gave the correct answer to the question of "the status of expressing true of the meaning of ILO term" and 35.9% of them gave the correct answer to the question of "the status of expressing true of the meaning of EU-OSHA term" respectively (Table 4). In this study, it is thought that the reason for not giving the correct answers to the meanings of the ILO and EU-OSHA terms is to use the short names of these terms, frequently.

In this study, it was determined that the nursing students answered correctly with the ratio of 91.8% to the question of "the evaluation status of the medical waste bag colours" and also it was determined that nearly all of them has been

answered correctly. This result is quite gratifying in terms of the richness of their information equipment of the nursing students. Additionally, it was determined that 60.2% of the participants from the research answered correctly to the question of "the status of determination of signboard meanings which are specified for hospital safety respectively" (Table 4). According to the Health and Safety Signs Regulation (Beyaz Kod Talimatı rew. 2013), these signs are very important in terms of information and warnings about occupational safety and occupational health. Actually, in terms of occupational health and safety, as in the all work places, also for the health sector, due to protect the employees from the danger, health and safety signs must be provided. The finding possession of signs is a criminal liability if not exert there is a penalty (ACAR OSGB, 2017). The red color used in the signs means "stop, forbidden and dangerous" and also represents "fire fighting". Yellow color means "warning and danger" and is used to indicate warnings such as fire, explosion, falling from steps, radiation and poisoning. Additionally, green color means "safe situation" and in some cases, the orange color instead of yellow color owing to be remarkable can also be used (ACAR OSGB, 2017). However, together with these placement of signs that are informative, stimulating and reminiscent, it is also very important for employees to be trained about this regard. Therefore, during the practice of the nursing students in hospitals, introduction of signs is important because of its sensitivity of the subject when they expose to risky environments in terms of to know the kind of danger and to take necessary precautions.

As a result of this research, it was found that the relationship between the classes in which the nursing students are being educated and the given answers to the total of eight questions evaluating their occupational attending and legislative approaches to occupational health and safety are significant ($p < 0.05$) (Table 5, Table 7) and according to the ANOVA test, the difference between these questions and the classes is significant ($p < 0.05$) and according to Tamhane's T2 test, it was determined that this difference increase according to class grade (Table 6, Table 8). As a result of this research, it has been determined that nursing students have very knowledgeable, positive and gratifying approaches intended for protecting the health of themselves and patients/healthy individuals in terms of occupational health and safety. In addition, due to the risks related to occupational health and safety that may be encountered in working conditions, in order to draw their attention and reinforce their knowledge it may be suggested to place occupational health and safety related courses into their curriculum.

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