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DETERMINING THE EXISTING HAZARDS AND THE MEASURES TO BE TAKEN IN ORAL AND DENTAL HEALTH CENTERS BY RISK ASSESSMENT

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ABSTRACT

As a result of the enactment of the Occupational Health and Safety Law No. 6331 and its related regulations in 2012, the concept of occupational health and safety at workplaces has gained particular importance and has become a legal obligation. As a result of the formalization of the concept of occupational health and safety in the legal context, penal sanctions have been imposed and it is aimed to establish control mechanisms for the protection of safety and health in workplaces. The most important tool in establishing these control mechanisms is risk assessment.

Although the risk assessment should be done by the employer, the issue of occupational health and safety concerns all employees in real terms.

Risk assessment at workplaces, preparation of emergency plans, organization of trainings and necessary inspections make the work environment safe and healthy. Healthcare facilities are one of the most dangerous and risky business lines. Healthcare workers are constantly

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exposed to physical, chemical, ergonomic, psychosocial and especially biological risks.

As the subject of the project, the oral and dental health hospital has been evaluated in terms of dangers and risks and the necessary precautions are presented. It was concluded that the high-grade risk scores obtained as a result of the study can be downloaded with easy, cheap and applicable methods. Thus, it is aimed to fulfill legal and conscientious responsibilities by preventing occupational diseases and work accidents in the workplace where risk assessment is carried out.

Key Words: Occupational health and safety, Oral and dental health hospital, Risk assessment, Control measures

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Introduction

The complex processes and new technologies used in today's production and service sectors require that more organizational measures be taken at the international level in order to ensure that necessary precautions are taken and regulations are made regarding occupational health and safety (OHS). For this reason, the International Labor Organization (ILO) and the World Health Organization (WHO), which have made important regulations in the field of OHS since the day they were founded, are developing many policies and strategies on the subject. OHS, which also has economic, social and international dimensions, is no longer a phenomenon that only concerns workers and employers individually.

In time, some legislation has been put into effect in our country to ensure occupational health and safety. The Occupational Health and Safety Law No. 6331, which came into force in 2012, which is seen as the most important of these and which considers risk assessment and fulfillment of health and safety measures in the workplaces among the basic obligations of the employer, emphasized the importance of this issue.

The most important point of occupational health and safety is to identify the dangers that may harm the health of the employees in the workplace, to take precautions and to make the work environment a safe place for the employees. Scientific and systematic studies carried out to determine the risks of the working environment and to take safety and

health measures in order to prevent work accidents and occupational diseases are within the scope of occupational health and safety [1].

Institutions where oral and dental health services are carried out constitute an important place in the health sector. Inpatient / outpatient and preventive health services are provided in the aforementioned institutions[2].

The increase in technological developments, the diversity in service branches and the increase in the number of people referred to these branches as patients for healthcare professionals serving in the health sector result in an increase in the risks of workplaces belonging to the health sector. These risks are frequently encountered in institutions where oral and dental health services are carried out. It is known that the chemicals used, infections during contact with patients, incorrect or incomplete ergonomic designs, and excessive workload pose a risk on employees.

In this study, the existing hazards in an Oral and Dental Health Center in Samsun were defined and the risks were evaluated according to the 5x5 L matrix method. Risks are scored according to probability and severity values. It is aimed to reduce the risk score by recommending the measures to be taken according to the values obtained.

[1] Devebakan N. Özel sağlık işletmelerinde iş sağlığı ve güvenliği. Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü, İzmir, Doktora Tezi, 2007; 8-156.

[2] Koraslı D. Ağız Diş Sağlığı Merkezinde Beklenilen ve Algılanan Hizmet Kalitesinin Ölçülmesi, Ankara Üniversitesi Yüksek Lisans Tezi, Ankara, 2008

2. CONCEPTUAL FRAMEWORK

It is necessary to know risks in order to reveal the dangers defined as threats that occur in the workplace or affect from the outside, which have the capacity to adversely affect human and environmental health for an enterprise, and to protect everyone connected with the workplace. This is especially the first step in creating a safe and healthy workplace[3].

Methods such as analyzing the workplace, conducting surveys, examining accident and disease records are recommended in order to examine the hazards prospectively and retrospectively. The relationship between the probability of occurrence of the hazard and the harm that will occur when it occurs is defined as risk. It is very important to evaluate the risks in the workplace in terms of the safety and health of the employees[4].

In the law no 6331 "The employer shall have a duty to ensure the safety and health of workers in every aspect related to the work. In this respect, the employer shall carry out a risk assessment or get one carried out" provision is included[5]. The risk assessment is carried out by a team formed by the employer. The risk assessment team consists of employer or employer's representative, occupational safety specialists and

[3] Sarıçam H., İş Sağlığı ve Güvenliği Kapsamında Hemşirelerin Karşılaştığı Risk ve Tehlikelerin İş Stresi Düzeyleri Üzerine Etkisi, Dokuz Eylül Üniversitesi Sağlık Bilimleri Enstitüsü, Y.L. Tezi, İzmir, 2012, 15

[4] Akpınar T. İş Sağlığı ve İş Güvenliği. 1. Baskı, Bursa, Ekin Yayınevi. 2013; 1-256.

[5] İş Sağlığı ve Güvenliği Kanunu, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=6331&MevzuatTur=1&MevzuatTertip=5, Erişim tarihi: 20.06.2020

workplace doctors who carry out health and safety services in the workplace, employee representatives in the workplace, support staff in the workplace, and employees who are determined to represent all units in the workplace and are knowledgeable about the work carried out in the workplace, current or potential sources of danger and risks. Risk assessment consists of the following 5 steps[6]:

a. Identification of hazards,

b. Identification and analysis of risks

c. Risk control steps,

d. Documentation in risk assessment,

e. Renewal of risk assessment.

Conducting a risk assessment is known to provide the following benefits to employers and employees:

a. Foreseeing hazards and risks, predetermining the rules

b. Reducing losses with the measures taken

c- Covering all employees

D. Increasing work efficiency

e- Being cautious in the face of emergencies as it is a proactive approach

[6] İş Sağlığı ve Güvenliği Risk Değerlendirmesi Yönetmeliği, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=16925&MevzuatTur=7&MevzuatTertip=5, Erişim Tarihi: 15.11.2021

f. Increasing the information quality of the management, ensuring compliance with existing laws[7].

2.1. Oral and Dental Health Services

An important part of general health services is oral and dental health services. Diseases of teeth and tooth-bearing tissues, which are among the most common health problems in our country and in the world, are an important public health issue, although they are not given importance because they are not fatal. Providing quality service prevents serious health problems[8]. It covers the preventive and protective services for the protection of the health of the teeth, gingiva and the tissues of the mouth and jaw directly connected with them, as well as the diagnosis and treatment of diseases and disorders[9].

2.2. Oral and Dental Health Service Units

These are the service units that provide preventive and protective oral and dental health services, as well as diagnostic and therapeutic oral and dental health services [9]. Institutions providing oral and dental health services named as Oral and Dental Health Polyclinics, Dental Treatment and Prosthesis Centers, Oral and Dental Health Center (ADSM), Oral and Dental Health Hospital, Oral and Dental Health

[7] Özyurt E, Sağlık Sektöründe Risk Analizi, Risk Yönetimi ve Ağız, Diş Sağlığı Merkezlerinde Risk, Beykent Üniversitesi Yüksek Lisans Tezi, İstanbul, 2014

[8] Öztaş, D., Demiralp, K., Ö., Güzeldemirci, G., Üstü Y., Doğusan, A.,R., Karahan, S., Arı, H., Özgül, E., Kartal, İ., Uğurlu, M., Türkiye'de Ağız ve Diş Sağlığı Merkezlerindeki Hizmetlerin Finansmanı ve Harcamaların Değerlendirilmesi, Ankara Med J, 2016;16(2):170-81 DOI: 10.17098/amj.35931

[9] Yataklı Tedavi Kurumları İşletme Yönetmeliği, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=85319&MevzuatTur=3&MevzuatTertip=5, 1983 Resmi Gazete: 13 Ocak 1983 – 17927, Erişim Tarihi: 09.10.2021

Training and Research Hospital, Private Oral and Dental Health Units , Dentistry Application and Research Centers[10].

2.3. Oral and Dental Health Services Employees

Health personnel working in workplaces that are classified as "dangerous" and "very dangerous" according to the legislation are faced with many dangers and risks during their work environment. Oral and dental health personnel with very different qualifications can be in many different professions such as; dentists, technicians (dental prosthesis, oral-dental health), medical imaging technician, nurse, support staff (personnel who provide support services such as cleaning, security, food, information processing).

2.4. Risks and Dangers that Employees May Encounter in Places where Oral and Dental Health Services are Carried out

The risks that occur for different occupational groups in workplaces providing oral and dental health services can be listed as follows[11]:

a. Security risks (risk factors such as; lighting levels, entrances-exits, machinery-tools-equipment, electrical components, fire etc.)

b. Physical risks (noise, temperature, radiation, ultrasound, microwave, laser

[10] SASAM Enstitüsü, Türkiye'de Ağız ve Diş Sağlığı Hizmetleri ve Çalışan Sorunları Analizi, Analiz dergisi, Sasam Yayınları YIL: 4 · SAYI: 12 · OCAK 2018 ISSN: 2459-0738

[11] Üstdal G, Diş hekimlerinin sağlığını tehdit eden etmenler ve işle ilişkili sağlık sorunları, Ege Tıp Fakültesi Halk Sağlığı Anabilim Dalı, Bitirme Tezi, İzmir, 2013

c. Chemical hazards (other chemicals such as mercury, drugs that kill the cell or stop its function, disinfectants, latex that can cause serious allergic effects, poisonous - methyl methacrylate that causes irritation and blindness in eye contact, anesthetic substances and gases, sterilants used in disinfecting microorganisms, etc.),

d. Biological risks (transmission factors such as Hepatitis viruses, HIV, syphilis, tuberculosis, herpes virus, covid-19, staphylococcal-streptococcal infections, etc.)

to. Ergonomic hazards (working in improper postures, prolonged standing work, etc.)

f. Psychosocial hazards (excessive shifts and long working hours, inadequate job descriptions, excessive workload, fear of the future, anxiety and stress, mobbing)

g. Sharps and piercing tools, consumption of contaminated food, contact with waste that poses a serious or potential threat to public health or the environment

Many infectious diseases such as HIV, hepatitis types, tuberculosis, herpes, etc., which have a very high risk of transmission, show their first symptoms in the mouth. For this reason, special attention should be paid to the infections that can be passed through the tools used in dental health services for dentists and other health personnel in workplaces that provide oral and dental health services.

In addition, risk factors that should be taken into account in all employees working in the workplaces providing oral and dental health

services include adverse effects on the eyes (carriage of microorganisms by aerosols emitted into the air, damage due to the power of laser light and exposure time) and adverse effects on the ears (high-frequency noise occurs during operation, since most of the tools used have small motors)[12].

The ways of entry of disease-causing agents into the human body can be through the skin, digestion, respiration and blood. Infection of healthcare personnel through blood occurs as a result of accidental stinging or cut-scratch by cutting and piercing tools (injector needle, scalpel, etc.) used in the treatment of patients[13].

2.5.1. Viral Infections

Infectious agents that should be considered in oral and dental health applications pass through especially from the tools used in the treatment of dental diseases. The fact that health personnel have detailed information about diseases and correct detection of them ensures that the risk of infection is minimized.

Among the infectious diseases, hepatitis virus infections that attach to the liver are important. Hepatitis A and E (HAV, HEV) are infections where full recovery is expected, while Hepatitis B, C, D, G (HBV, HCV, HDV, HGV) are infections that cause chronic effects.

[12] Şenel B. Diş hekimleri için risk taşıyan hastalıklar ve diş hekimlerinin mesleki rahatsızlıkları. Gülhane Tıp Dergisi, 2007, 49, 204-212.

[13] Kandemir S, Karataş S. Mesleğini sürdüren diş hekimlerinin mesleğe bağlı sağlık şikâyetlerinin belirlenmesi. Cumhuriyet Üniversitesi Diş Hekimliği Fakültesi Dergisi 2001; 4: 41-46.

Tuberculosis bacteria, which is an airborne bacterial infection, does not develop in many people, although infection occurs. However, once infected, there is always the risk of developing an active disease as a result of the deterioration of the immune system in the lungs of the person. In tuberculosis, tissue disorders and wounds can be seen on the tongue, lips, buccal mucosa and palate. In terms of the health of oral and dental health workers, oral and dental treatments of patients with active tuberculosis disease should be postponed, except in emergencies. It is necessary to carry out the treatment of the tuberculosis patient in the appropriate position and to use a "rubber dam" that cuts the contact with the bacteria and saliva during the treatment. In cases of vital infection or trauma, it is important for the personnel performing the treatment to use effective masks against tuberculosis and to create environments where ventilation is continuous.

Moniliasis infection, which is one of the first signs of AIDS that develops in the mouth in HIV-positive individuals, herpes infections along with some opportunistic infections and some tumors can be diagnosed by the dentist.

The herpes virus is seen around the mouth and lips, and the infection of the virus occurs when the virus passes to the skin or glandular membrane as a result of contact with the person. Except for emergencies, oral and dental treatments should be postponed until the virus is over.

Since syphilis lesions can be found on the tongue and inside the mouth, the disease can also be transmitted orally. Oral findings in different stages of syphilis should be well known[14].

2.5.2. Musculoskeletal Disorders

As a result of the compression of the nerve passing through the carpal tunnel, the disease called Carpal tunnel syndrome occurs. It is almost impossible for the wrist joint to maintain the neutral position in workplaces where small hand tools are used. When the wrist is flexed, the pressure in the carpal tunnel is increased by the use of hand tools.The increase in pressure causes occlusion of the vessels within the nerve and a decrease or cessation of blood flow in the median nerve (the only nerve that passes through the carpal tunnel). In order to reduce the risk of developing this disease, repetitive wrist movements should be avoided, wrist and fingers should be warmed up with some movements before repetitive procedures. While the patients are being treated, time should be taken to rest and hand tools should be of the type that can rotate 360 degrees[15].

Especially in dentists, staying in the same position for long hours causes pain in the back and waist. In order to reduce this risk, breaks should be taken during work, muscle stretching movements should be performed,

[14] Aydın M, Mısırlıgil A. Ağız mikrobiyolojisi. MN medikal Nobel Kitapevi, 2012, İstanbul

[15] Şenel B. Diş hekimleri için risk taşıyan hastalıklar ve diş hekimlerinin mesleki rahatsızlıkları. Gülhane Tıp Dergisi, 2007, 49, 204-212.

muscle strength of the body, arms and legs should be increased and chronic pain should be reduced with regular exercises.

Moving tools used in oral and dental treatment create a mechanical vibration effect. This effect is transmitted directly to the hand. Employees' exposure to vibration occurs when the vibration is transmitted from the tip of the machine to the hand and fingers. As a result of this affection, occupational “Raynaud's phenomenon” disease occurs, which causes damage to vessels, bones, joints, muscles and nerves. In order to prevent this, periodic maintenance-repairs of the machines used in dental treatment and regular health checks of the hands, arms and fingers of the users are required[16].

2.5.3. Visual Disorders

The risk of injury to the eyes is quite high due to the use of rapidly rotating instruments for removal of filling and spattering of bone tissue fragments. In addition, a large amount of water is sprayed to clean the tooth surface. In this process, too many particles and saliva containing bacteria are scattered and there is a risk of contact with the eyes. The most effective way to avoid these risks is the use of glasses that fit the face[17]. Lasers used for dental treatment are also a very damaging application to the eye. To prevent this, high quality laser instruments should be used while performing treatment.

2.5.4. Hearing Losses

[16] Szymanska J. Dentist's hand symptoms and high-frequency vibration. Ann Agric Environ Med 2001; 8: 7-10.

[17] Szymanska J. Dentist's hand symptoms and high-frequency vibration. Ann Agric Environ Med 2001; 8: 7-10.

The most important cause of hearing loss is continuous and high frequency noise. Since noise exceeding 80-90 dB during the working day will cause damage to the ear, it is recommended that the tools be maintained periodically and the acoustic floor of the ceiling should be designed as elastic in order to prevent this risk. In addition, earplugs can be used as a personal precaution[18].

2.5.5. Allergy

Allergies that may occur in the employee due to the chemicals used in dental health and the use of latex gloves by the employees may pose a risk. For this reason, employees should have sufficient knowledge about chemicals and use latex-free vinyl or nitrile group gloves instead of latex gloves[19].

2.5.6. Varicose Veins

Varicose veins, which are usually seen on the thigh and calf, are defined as the appearance of blue under the skin as a result of the enlargement and curling of the veins. It causes pain and swelling in the legs. Sitting for long periods of time (over an hour) or standing during work poses this risk. Doing regular sports such as walking, swimming, not wearing high heels, resting and not smoking reduce the risk of varicose veins.

[18] Şenel B. Diş hekimleri için risk taşıyan hastalıklar ve diş hekimlerinin mesleki rahatsızlıkları. Gülhane Tıp Dergisi, 2007, 49, 204-212.

[19] Baran İ., Nalçacı R., 2007, Diş Hekimliğinde Kullanılan Materyaller ve Alerjik Reaksiyonlar, Atatürk Üniv. Diş Hek. Fak. Derg. Suppl.: 2, Yıl: 2007, Sayfa: 26-32

2.6. Risk Assessment Methods

Occupational accidents, which occur as a result of risks arising from the working conditions and nature of the work in the workplace, can cause injuries, illnesses, loss of limbs and deaths of employees, as well as damage to work equipment and loss of material and prestige. The first of two basic approaches in risk analysis in Occupational Health and Safety; "reactive" approach based on post-accident investigation and reorganization of the work so that the accident does not reoccur, the second is the "proactive" approach, which focuses on the creation of a safety management system, in which risk assessment and safety culture awareness is particularly emphasized, and which is based on reducing or, if possible, eliminating the risks of the system before the accident occurs[20].

Current risk assessment techniques are generally grouped into three groups. These are qualitative, quantitative and mixed methods[21]. Quantitative risk assessment methods are calculated using numerical methods such as probability and reliability theorems and simulation models. In quantitative risk assessment analysis, the risk value is found by mathematical and statistical processes by giving numerical values to the probability and severity of the occurrence of the hazard. Qualitative risk assessment methods use descriptive (qualitative-ordinal-sequential) values (such as low, high, very high) instead of numerical

[20] ODTÜ Sağlık ve Rehberlik Merkezi, https://srm.metu.edu.tr/tr/system/files/varis-brosur.pdf, Erişim Tarihi:10.08.2021

[21] Kurt M., Ceylan H., "İş Güvenliğinde Tehlike Değerlendirme Teknikleri", Gazi Üniversitesi Fen Bilimleri Enstitüsü Dergisi, Vol: 14, No: 4, s. 1117-1130, Ekim-2001.

(quantitative-numerical-numeral-mathematical) values during the calculation and expression of risk. For this reason, the results of qualitative risk analysis can be more subjective rather than objective[22].

Occupational safety experts decide which of the risk assessment methods will be used. It should not be forgotten that the safety of the business cannot be ensured in every aspect as a result of making a complex risk assessment for a simple business that has very small dangers, as well as the pecuniary and non-pecuniary damages caused by a simple risk assessment to a business that can host very great dangers. For this reason, as a result of applying the risk assessment method that is not suitable for the job, unnecessary loss of time, being late in cases where security measures should be implemented immediately, or work accident or occupational disease will occur before these measures are taken.

3. FINDINGS AND DISCUSSIONS

Employees in the workplace, where oral and dental health services, which have an important place in the health sector, are carried out, are constantly exposed to occupational hazards due to the technological developments in the sector and the large number of patients. For this reason, the hazards of an Oral and Dental Health Center in Samsun were determined and the study was carried out using the 5x5 L type matrix

[22] Kurt M., Ceylan H., "İş Güvenliğinde Tehlike Değerlendirme Teknikleri", Gazi Üniversitesi Fen Bilimleri Enstitüsü Dergisi, Vol: 14, No: 4, s. 1117-1130, Ekim-2001.

method while evaluating the risk. Obtained risk scores were ordered from the highest to the lowest, and by determining the control measures to be taken, it was aimed to reduce the risk score and to make the workplace more reliable for the employees.

3.1. 5x5 L-type Risk Matrix Method

In the study, risk assessment of the workplace was carried out with the 5x5 L type matrix method. The L-type matrix (5x5 matrix) method is a risk assessment method that evaluates the relationship between the probability of occurrence of hazards between two or more variables and the damage that may occur as a result. In this method, the dangers that will require urgent intervention and that need to be taken as soon as possible are determined.

Risk Assessment = Probability x Severity

The accident probability in workplaces where risk assessment is made (O) is divided into 5 groups as very small, small, medium, high and very high (Table 3.1).

Table 3.1. Probability Measures of L-Type Matrix Method[23]

Probability	Evaluation Steps for Probability of Occurrence

[23] Şafak, RE.; Şensöğüt, C.; Kasap, Y.; 2018, Açık Ocak İşletmelerinde İş Güvenliği Uygulaması: Örnek Ocak Çalışması, Bilimsel Madencilik Dergisi, Özel sayı; 99-108

very small	1 (Hardly ever)
small	2 (Very rare (once a year), only in abnormal situations)
medium	3 (Few times a year)
high	4 (Often (monthly))
very high	5 (Very often (once a week, every day), under normal operating conditions)

The severity variable, which is the second variable, is again divided into 5 groups as very mild, mild, moderate, serious and very serious (Table 3.2).

Table 3.2 L-Type Matrix Method Intensity Measures [23]

Severity	**Ortaya Çıkma Olasılığı İçin Değerlendirme Basamakları**
Very Mild	1 (No loss of working hours, first aid required)
Mild	2 (No loss of workday, no lasting effect, outpatient treatment, first aid required)
Medium	3 (Minor injury, requires inpatient treatment, several times a year)
Serious	4 (Serious injury, prolonged treatment, occupational disease)
Very Serious	5 (Death, permanent incapacity)

The risk scores matrix, which will consist of the product of probability and severity functions, is shown in Table 3.3.

Table 3.3. Risk Scores Matrix [24]

Severity Probability	Very Mild	Mild	Medium	Serious	Very Serious

[24] Özkılıç, Ö. "İş Sağlığı, Güvenliği ve Çevresel Etki Risk Değerlendirmesi", TİSK Yayınları, Yayın No: 540, Aralık 2007.

Very Low	1 (Meaningless)	2 (Low)	3 (Low)	4 (Low)	5 (Low)
Low	2 (Low)	4 (Low)	6 (Medium)	8 (Medium)	10 (Medium)
Medium	3 (Low)	6 (Medium)	9 (Medium)	12 (Medium)	15 (High)
High	4 (Low)	8 (Medium)	12 (Medium)	16 (High)	20 (High)
Very High	5 (Low)	10 (Medium)	15 (High)	20 (High)	25 (intolerable)

According to the results obtained, the Acceptability Values of the Result (SKED) table is shown in Table 3.4. Accordingly, suspension of work or measures to be taken are decided in order of priority.

Table 3.4. Acceptability Value of the Result

Result	**Action**	**Importance level**
Unbearable Risks (25)	Work should not be started until the identified risk is reduced to an acceptable level, if there is any ongoing activity, it should be stopped immediately. If it is not possible to reduce the risk despite the actions taken, the activity should be blocked.	**A**

High Level Risks (15,16,20)	Actions should be initiated to reduce the identified risks. Risk reduction measures can take time.	**B**
Medium Level Risks (6, 8, 9, 10, 12)	Additional control processes may not be needed to eliminate identified risks. However, existing controls should be maintained and it should be supervised that these controls are maintained.	**C**
Low Risks (5,4,3,2,1)	There may be no need to plan control processes and keep records of activities to be performed to eliminate identified risks.	**D**

3.2. Risk assessment

In this study, risk scores were determined as a result of exposure to existing hazards, based on the Checklist prepared according to the Risk Assessment Guidelines in Dental Clinics and Practices published by the Ministry of Labor and Social Security. Hazards are examined under the headings General, Workplace order and hygiene, Electricity, Psychosocial Risk Factors, Chemical factors, Biological factors, Education and information, Emergency, Ergonomics, Accidents and diseases, Machines and hand tools. Categorizing the fields in this way made the identification of sources of danger easier.

As a result of the risk assessment, a total of 106 risks belonging to the Oral and Dental Health Center were identified. Of these, 45 were identified as high risk (significance B), 35 as medium risk (significance C), and 26 as low risk (significance D). The risks posed by the categorized hazards are listed below:

1- Hazards examined under the title of electricity are absence of residual current relay in electrical panels, easy access of unauthorized persons to dashboards and fuses, not insulating the front of electrical panels, damaged electrical connections, irregularity of the cables of the wired tools used. The risks posed by these hazards fall into the high-level risk category (B). That is, they are risks with a score of 15, 16, 20.

2- The dangers examined under the general title are the absence of stair railings, the lack of regular maintenance of elevators, insufficient warning signs, deformations on the floor, and the floor not covered in a way to prevent slipping. The risks posed by these hazards fall into the high-level risk category (B). That is, they are risks with a score of 15, 16, 20.

3- The dangers examined under the title of psychosocial factors are exposure of employees to verbal or physical violence, burdening the employee with duties other than their duties and responsibilities, ignorance of the authorities and responsibilities of the employees, intense work tempo, and lack of communication with the employer. The risks posed by these hazards fall into both high-risk (B) and moderate-risk categories (C). That is, they are risks with a score of 15, 16, 20 and 6, 8, 9, 10, 12.

4- The hazards examined under the title of ergonomics are that the employees work in the same position and standing for a long time, working on a desk and chair which is unsuitable for the job, the use of vibrating hand tools, and the manual handling of the loads. The risks posed by these hazards fall into both high-risk (B) and moderate-risk categories (C). That is, they are risks with a score of 15, 16, 20 and 6, 8, 9, 10, 12.

5- The hazards examined under the emergency title are the absence of emergency plans, the failure of the emergency signs to be placed in appropriate places and in sufficient numbers, the failure to provide lighting on the fire escape ladder, the absence of a lighting alternative to be activated in case of a power outage in emergency situations, the absence of plans showing the location of fire extinguishers, and the failure to check the expiration dates of fire extinguishers. The risks posed by these hazards fall into both high-risk (B) and moderate-risk categories (C). That is, they are risks with a score of 15, 16, 20 and 6, 8, 9, 10, 12.

6- Hazards examined under the title of biological factors are eating/drinking in areas where employees may be exposed to biological agents, not sterilizing/disinfecting the work area, contact with blood and oral fluids, and the failure to collect/store/dispose of medical wastes properly. The risks posed by these hazards fall into both high-risk (B) and moderate-risk categories (C). That is, they are risks with a score of 15, 16, 20 and 6, 8, 9, 10, 12.

7- The dangers examined under the title of workplace order and hygiene are unhealthy use of toilets and sinks, not closing the lids of the garbage, not disinfecting the containers after the garbage is emptied, not placing the materials in their places after the end of the work. The risks posed by these hazards are in the Moderate risk category (C). That is, they are risks with a score of 6, 8, 9, 10, 12.

8- Hazards examined under the title of training and information are not providing regular occupational health and safety trainings to employees, the lack of knowledge of the employees about workplace

risks (physical, chemical, biological, ergonomic, psychosocial), not recording and archiving the trainings given, and employees lack of training on the safe use of tools/equipment/equipment used. The risks posed by these hazards are in the Moderate risk category (C). That is, they are risks with a score of 6, 8, 9, 10, 12.

9- Hazards examined under the heading of accidents and diseases, not reporting work accidents and occupational diseases to the institution (SGK), and not recording the previous accidents, illnesses and near-miss incidents. The risks posed by these hazards are in the Moderate risk category (C). That is, they are risks with a score of 6, 8, 9, 10, 12.

10- Hazards examined under the title of chemicals are lack of material safety data sheet and labels for chemicals, improper storage of chemicals, non-compliance with storage conditions, insufficient local and general ventilation in the environment where the chemical is processed, lack of instructions on the use of chemicals, lack or non-use of personal protective equipment to prevent worker exposure to chemicals. The risks posed by these hazards fall into the high-level risk category (B). That is, they are risks with a score of 15, 16, 20.

11- Hazards examined under the title of machines, hand tools and auxiliary apparatus are the use of x-ray equipment by untrained people without taking necessary precautions, the lack of user manuals, the use of laser-operated devices/tools/machines by untrained persons without taking necessary precautions, lack of maintenance/periodic checks of machines, and Removal/absence of the necessary protective panels to protect from the moving parts of the machines. The risks posed by these hazards fall into the high-level risk category (B). That is, they are risks with a score of 15, 16, 20.

In addition to the ones listed above, the dangers examined under the title of security are uncontrolled entry of visitors and patients into practice and laboratories, which are areas where intensive studies are carried out, and failure of security cameras to work. The risks posed by these hazards fall into the high-level risk category (B). That is, they are risks with a score of 15, 16, 20.

3.3. Precautions taken

1- In order to reduce the risks posed by the hazards examined under the title of electricity;

- There should be a residual current relay in the panels in order to detect the leakage in case of electrical leakage and turn off the system.

- All fuses should be in sheltered places and necessary precautions should be taken.

- The base of the existing electrical cables, panels and control equipment etc. in the building should be covered with a fully insulating material against electric current.

- Grounding and residual current relays of electrical panels must undergo periodic maintenance by authorized persons once a year.

- All cables must be protected and damaged ones must be replaced with new ones.

2- In order to reduce the risks posed by the hazards examined under the title of general;

- Stair rails must be of appropriate height and queen posts must be designed to prevent falling.

- Elevators should be regularly maintained by authorized persons.

- Incomplete warning signs inside or outside the workplace should be completed.

- Old and worn floors should be repaired, floors and passages that have become wet/slippery for any reason should be cleaned immediately.

3- In order to reduce the risks posed by the hazards examined under the title of psychosocial factors;

- Employees should be informed about how they will behave in the face of negative attitudes and behaviors (insult, threat, mobbing, harassment, etc.). The health worker should not be left alone while meeting with more than one patient's relatives.

- Employees should not be assigned tasks other than their duties and responsibilities.

- Roles, authorities and responsibilities should be defined for each employee.

- Communication between employees and managers needs to be strengthened.

4- In order to reduce the risks posed by the hazards examined under the title of ergonomics;

- During work, appropriate rest breaks should be given and the body should be stretched with simple exercises.

- The angle of the chair used by both the patient and the dentist should be such that the dentist can work comfortably.

- In the selection of vibrating hand tools, the ones with cork, rubber or plastic-coated handles should be preferred in order to absorb the vibration transmitted to the hand.

- If possible, heavy loads should be carried by vehicles such as wheelbarrows and forklifts, if not, the load should be transported in pieces.

- A transportation plan should be created by paying attention to the storage and transfer points.

5- In order to reduce the risks posed by the hazards examined under the title of emergency;

- An emergency plan should be prepared, plans should be prepared for emergencies such as fire, earthquake, flood, flash, explosion, chemical leakage, sabotage, etc.

- Emergency exits should be identified with illuminated exit signs. These exits should be directed with arrows to be hung at certain intervals inside the building and should be placed at a height of 200-240 cm from the ground.

- There should be emergency lighting and the generator should be activated when there is a power outage at the workplace.

- There should be a situation plan showing the locations of fire extinguishing equipment such as fire extinguisher tube, fire alarm button, fire cabinet, and it should be hung in the visible place of the workplace.

- Fire extinguishers should be easy to access and expiration dates should be checked routinely.

6- In order to reduce the risks posed by the hazards examined under the title of biological factors;

- Eating and drinking should be prohibited in areas where there are biological hazards (biological agents such as blood, saliva, virus / bacteria / fungus, etc.).

- It is necessary to clean, sterilize/disinfect the working environment in order to prevent contact with the biological agent.

- Appropriately treated medical and biological wastes should be collected and stored by employees using personal protective equipment, and warehouses should be kept under lock and key.

7- In order to reduce the risks posed by the hazards examined under the title of workplace order and hygiene;

- The cleanliness of the toilets and sinks in the workplace should be given due importance, the sinks should be kept clean and the employees should be warned.

- Garbage must be tightly tied, left without water, and the attendant must dispose of the garbage using gloves.

- Waste should be collected regularly and garbage containers should be disinfected after each emptying.

- The personnel should regularly replace the materials used after they have finished their work.

8- In order to reduce the risks posed by the hazards examined under the title of education and information;

- Employees should be given periodic training on Occupational Health and Safety issues by authorized occupational safety experts.

- No employee should be allowed to start work without documents that they have received occupational safety training.

- Employees should be informed about workplace risks by occupational safety experts and workplace doktor, and necessary instructions should be read by employees.

- All training and exercises given must be documented and properly stored.

- Employees must be trained in the safe use and maintenance of tools and equipment used in the workplace.

9- In order to reduce the risks posed by the hazards examined under the title of accidents and diseases;

- The notification of work accidents and occupational diseases to the Social Security Institution must be made through the work accident and occupational diseases notification form, which can be accessed at www.sgk.gov.tr.

Occupational accidents, occupational diseases and near-miss events that occur in the workplace or occur due to dangers that may come from outside should be recorded.

10- In order to reduce the risks posed by the hazards examined under the heading of chemicals;

- It should be ensured that the material safety data sheets of the chemicals required to be used in the workplace are kept in a file at an easily accessible point.

- Chemicals should be classified and stored in such a way that they do not react dangerously and should be stored in accordance with the label information.

- In order to protect the health and safety of the employee, instructions against chemical risk factors should be prepared and personal protective equipment should be provided and kept ready at the workplace.

11- In order to reduce the risks posed by the hazards examined under the title of machines, hand tools and auxiliary apparatus;

- Personnel using the X-ray device should be specially trained and use PPE.

- For the X-ray device and laser-operated device/tool/machines, user manuals and instructions should be obtained from the manufacturer and their safe use should be ensured.

- All devices/tools/machines should be periodically maintained and repaired.

- Protective panels designed to protect workers from the moving parts of the machines should not be removed.

4. CONCLUSION and RECOMMENDATIONS

Within the scope of this study, the risk factors (physical, chemical, biological, psychosocial and ergonomic) that may be caused by the existing hazards in an Oral and Dental Health Center were analyzed, evaluated and categorized as 106 items. These risks are grouped as those arising from mechanical and electronic work equipment, those arising from the lack of emergency procedure, those caused by lack of education, those arising from biological risks such as viruses, bacteria and fungi, which are the most encountered in the health sector due to contact with the patient, those originating from chemicals used for treatment and disinfection, and those caused by the noise of instruments used for treatment etc. In addition, musculoskeletal disorders that may occur in healthcare personnel as a result of ergonomic hazards are also included in the risk assessment procedure. In ensuring occupational health and safety, intervention at the source of danger is one of the leading measures to be taken. For this reason, recommendations for prevention at source are presented where possible for the listed risks. In addition, the suggestions presented were supported by practices aimed at the environment and the person, such as the organization of the

workplace and the use of personal protective equipment. With this method, the legal obligations will be fulfilled and the dangers and risks will be prevented as a result of the effective management of the business. Continuity of occupational health and safety will be ensured by instilling awareness of safety culture in employees through training.

In this study, it was concluded that risks evaluated as high (B) can be reduced to low (negligible) level (D) with easy, cheap and applicable methods with precautions to be taken. With this study, it was concluded that for dangerous workplaces such as Oral and Dental Health Centers, the first goal should be to adopt the safety culture of the employees, to make the risk assessment by competent people and to take the necessary precautions immediately without ignoring them.

BIBLIOGRAPHY

Akpınar T. İş Sağlığı ve İş Güvenliği. 1. Baskı, Bursa, Ekin Yayınevi. 2013; 1-256.

Aydın M, Mısırlıgil A. Ağız mikrobiyolojisi. MN medikal Nobel Kitapevi, 2012, İstanbul

Baran İ., Nalçacı R., 2007, Diş Hekimliğinde Kullanılan Materyaller ve Alerjik Reaksiyonlar, Atatürk Üniv. Diş Hek. Fak. Derg. Suppl.: 2, Yıl: 2007, Sayfa: 26-32

Devebakan N. Özel sağlık işletmelerinde iş sağlığı ve güvenliği. Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü, İzmir, Doktora Tezi, 2007; 8-156.

http://www.varis-ufuk.com/varis2.htm (Erişim tarihi: 02 Haziran 2020).

İş Sağlığı ve Güvenliği Kanunu, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=6331&MevzuatTur=1&MevzuatTertip=5, Erişim tarihi: 20.06.2020

İş Sağlığı ve Güvenliği Risk Değerlendirmesi Yönetmeliği, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=16925&MevzuatTur=7&MevzuatTertip=5, Erişim Tarihi: 15.11.2021

Kandemir S, Karataş S. Mesleğini sürdüren diş hekimlerinin mesleğe bağlı sağlık şikâyetlerinin belirlenmesi. Cumhuriyet Üniversitesi Diş Hekimliği Fakültesi Dergisi 2001; 4: 41-46.

Koraslı D. Ağız Diş Sağlığı Merkezinde Beklenilen ve Algılanan Hizmet Kalitesinin Ölçülmesi, Ankara Üniversitesi Yüksek Lisans Tezi, Ankara, 2008

M. Kurt, H. Ceylan, "İş Güvenliğinde Tehlike Değerlendirme Teknikleri", Gazi Üniversitesi Fen Bilimleri Enstitüsü Dergisi, Vol: 14, No: 4, s. 1117-1130, Ekim-2001.

ODTÜ Sağlık ve Rehberlik Merkezi, https://srm.metu.edu.tr/tr/system/files/varis-brosur.pdf, Erişim Tarihi:10.08.2021

Özkılıç, Ö. "İş Sağlığı, Güvenliği ve Çevresel Etki Risk Değerlendirmesi", TİSK Yayınları, Yayın No: 540, Aralık 2007.

Öztaş, D., Demiralp, K., Ö., Güzeldemirci, G., Üstü Y., Doğusan, A.,R., Karahan, S., Arı, H., Özgül, E., Kartal, İ., Uğurlu, M., Türkiye'de Ağız ve Diş Sağlığı Merkezlerindeki Hizmetlerin Finansmanı ve Harcamaların Değerlendirilmesi, Ankara Med J, 2016;16(2):170-81 DOI: 10.17098/amj.35931

Özyurt E, Sağlık Sektöründe Risk Analizi, Risk Yönetimi ve Ağız, Diş Sağlığı Merkezlerinde Risk, Beykent Üniversitesi Yüksek Lisans Tezi, İstanbul, 2014

Sarıçam H., İş Sağlığı ve Güvenliği Kapsamında Hemşirelerin Karşılaştığı Risk ve Tehlikelerin İş Stresi Düzeyleri Üzerine Etkisi, Dokuz Eylül Üniversitesi Sağlık Bilimleri Enstitüsü, Yüksek Lisans Tezi, İzmir, 2012, 15

SASAM Enstitüsü, Türkiye'de Ağız ve Diş Sağlığı Hizmetleri ve Çalışan Sorunları Analizi, Analiz dergisi, Sasam Yayınları YIL: 4 · SAYI: 12 · OCAK 2018 ISSN: 2459-0738

Szymanska J. Dentist's hand symptoms and high-frequency vibration. Ann Agric Environ Med 2001; 8: 7-10.

Szymanska J. Work-related vision hazards in the dental office. Ann Agric Environ Med 2000; 7: 1-4.

Şafak, RE.; Şensöğüt, C.; Kasap, Y.; 2018, Açık Ocak İşletmelerinde İş Güvenliği Uygulaması: Örnek Ocak Çalışması, Bilimsel Madencilik Dergisi, Özel sayı; 99-108

Şenel B. Diş hekimleri için risk taşıyan hastalıklar ve diş hekimlerinin mesleki rahatsızlıkları. Gülhane Tıp Dergisi, 2007, 49, 204-212.

Şimşek A., İş Sağlığı ve Güvenliğinde Risk Değerlendirme Aşamaları, 2014, Vergi Raporu, Sayı 173, Şubat 2014.

Üstdal G, Diş hekimlerinin sağlığını tehdit eden etmenler ve işle ilişkili sağlık sorunları, Ege Tıp Fakültesi Halk Sağlığı Anabilim Dalı, Bitirme Tezi, İzmir, 2013

Yataklı Tedavi Kurumları İşletme Yönetmeliği, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=85319&MevzuatTur=3&MevzuatTertip=5, 1983 Resmi Gazete: 13 Ocak 1983 – 17927, Erişim Tarihi: 09.10.2021