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Occupational Risks of Health Professionals

Nilgun Ulutasdemir and Ferdi Tanir

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Abstract

Health service is an important work area which can lead to important risks related to occupational health and safety (OHS) of employees. This book chapter is prepared to evaluate the effects of occupational risks on health and decrease the exposure to occupational risks of health professionals by searching national and international literature. Thus, awareness can be raised to define occupational risks and help planning services for health professionals. American National Institute for Occupational Safety and Health (NIOSH) has reported 29 kinds of physical, 25 kinds of chemical, biological 24 varieties, 10 and six kinds of ergonomic and psycho-social hazards and risks. According to ILO, it has been reported that there is 1.25 trillion dollars loss each year due to the OHS problems. In Turkey, the loss of only social security systems has been reported as approximately 4 million Turkish Liras per year. Health professionals have work stress, and they suffer from the inconvenient design and the hazards within the workplace. The health of the health professionals affects the health of the community. Thus, it is important to decrease the exposure to occupational risks of health professionals and diligently work on this issue.

Keywords: health, safety, occupational risk factors, occupational management, health workers

1. Introduction

Health service is an important work area which can lead to important risks related to health and safety of employees [1]. Occupational risks of health professionals can alter according to the profession, the work itself and the unit of the hospital [2].

Work conditions of health professionals are quite challenging in some regions. The precautions about the occupational safety are not sufficient in hospitals and health institutions. Professional development and education opportunities of health professionals are limited, and the professional organizations are also insufficient [3]. It has been reported that

increasing working hours per week results in an increase in the possibility of being injured. Professionals, who did not receive the occupational health and safety (OHS) training before, have more accidents [4]. Nonfatal accidents at work and occupational disease cases of health professionals take place at the top compared to other industries [5]. But in Turkey, the inclusion of hospitals in “Very Dangerous Jobs” class was approved barely in 2009 via “Hazard Classes List Notification Relating Work Health and Safety” [6, 7]. This list was formed according to NACE code.

2. Occupational risks of health professionals

The health-related risks associated with health professionals can be grouped as psychosocial, physical, biological, chemical and ergonomic factors. American National Institute for Occupational Safety and Health (NIOSH) has reported 29 kinds of physical, 25 kinds of chemical, biological 24 varieties, 10 and six kinds of ergonomic and psycho-social hazards and risks [8–11].

3. Physical risk factors

The main physical risk factors which affect health professionals are ionizing and nonionizing radiation, noise, lighting, electrical assembly, slippery floors, hot/cold, ventilation, vibration and indoor pollution. Ionizing radiation is one of the most important physical hazards in hospitals, and it influences various different health professionals in different units and with different professions (mainly radiotherapy, nuclear medicine and radiology staff). It has carcinogenic, teratogenic and mutagenic impacts, and it is fatal in high concentrations. It leads to burns, cataracts, infertility, genetic and congenital anomalies in moderate concentrations, and it causes cancer (particularly leukemia) during long-term exposure [8, 12, 13]. Nonionizing radiation is another physical risk factor for health professionals. It has been stated that the increment in the use of devices with electromagnetic fields and exposure to these electromagnetic fields deteriorate the body balance and lead to diseases. It has been reported that the exposure to nonionizing radiation particularly during the work time about 8–10 h leads to feeling of dryness in the throat, eye problems, headaches, allergies, facial flushing, insomnia, sensitivity to sounds, hearing difficulties and fatigue [8, 14, 15].

Loudness is another important factor, which disturbing people, complicates the communication, restricts the relaxation, adversely affects and harms the nervous system, reduces the work efficiency and creates hearing problems. Studies have shown that loudness has increased at a level of discomfort in patients and health professionals in hospitals in the last 50 years [12, 16, 17].

The ventilation system of the hospitals has importance in the health protection of both patients and health professionals in terms of nosocomial infections. Therefore, the ventilation systems should be established to prevent the nosocomial infections by paying attention to biological and physical features of related microorganisms [2].

Another physical factor that can affect the health professionals is the lighting of the workplace. A sufficient and satisfactory level of lighting should be arranged in order to provide a comfortable workplace to the health professionals [18].

4. Chemical risk factors

Various chemicals are key agents which are used in order to diagnose and treat the diseases, perform the preventive applications and take hygienic precautions, whereas they are hazardous for health status of health professionals. Health professionals are exposed to chemicals (disinfectants to anesthetic agents, cytotoxic agents, drugs and some heavy metals such as mercury and latex) repeatedly and sometimes in very dense amounts. Similarly, their impacts show a wide variety according to the concentrations, contact time and way, the presence of other risky agents and personal features, etc. [19]. Acids and alkalis, salts, dyes, volatile organic solvents, various drugs including primarily anticancer drugs in pathology, biochemistry, hematology and other laboratories are important risk factors for a series of diseases from allergy to cancer [8, 20].

Drugs that cause severe organ toxicity and other toxic effects and drugs that show mutagenic, carcinogenic, teratogenic effects or any of the reproductive system disorders are defined as "hazardous drugs." The long-term exposure to these antineoplastic/cytotoxic drugs used in chemotherapy leads to potential risks in health professionals. At the stage of preparation, administration and waste disposal of these drugs, severe health outcomes can be observed due to the inhalation of powder and droplets, the absorption through the skin, the ingestion of contaminated food as well as particularly teratogenic, carcinogenic and genotoxic effects that threaten the reproduction during pregnancy [10, 12, 13, 19–23].

5. Biological risk factors

5.1. Agents transmitted by respiration and droplets

Some agents such as droplets and droplet cores can be transmitted via respiratory secretions of patients. Tuberculosis, measles, rubella, chicken pox, *severe acute respiratory syndrome* (SARS), influenza, meningococcal and pneumococcal infections transmit in this way [10, 13]. According to the various studies performed in Turkey, it has been detected that health professionals, particularly nurses, are under the risk particularly those working in pulmonary disease services [24, 25]. Demir et al. have performed a study in order to determine the tuberculosis infection risk among health professionals working in pulmonary disease hospital and another hospital which does not have pulmonary disease clinic. They have shown that the tuberculosis infection risk was 7.4 times higher in pulmonary disease hospital compared to the other hospital without pulmonary disease clinic because of the higher tuberculosis exposure [26].

5.2. Infections transmitted through direct contact

These infectious agents transmit through direct contact with the patient. There is no need to be in contact with the skin or mucosa as well as the loss of skin integrity for the transmission.

Resistant bacteria and skin parasites such as scabies are examples of microorganisms which can lead to severe infections in inpatients [24].

5.3. Biological agents transmitted by blood and bloody body fluids

These biological agents can transmit through the skin due to its impaired integrity and mucous membranes (mouth, eye and urogenital mucosa) as a result of the exposure to blood and/or bloody body fluids and some sterile body fluids. Even though there are almost 30 microorganisms which can be transmitted in this way, the most important ones are hepatitis B virus (HBV), hepatitis C virus (HCV), hepatitis D virus (HDV) and human immunodeficiency virus (HIV) since they can lead to systemic infections because of their current importance. The diversity of the clinical outcomes of these agents varies from asymptomatic infections to severe and even fatal infections [3, 4, 12, 13, 24, 27, 28]. The transmission of the infections via blood occurs mostly by the penetration of the needles used in patients, injury with contaminated sharp instruments or mucosal splashes infected blood or body fluids [29, 30]. It has been specified that the two-third of the health professionals stated that they were exposed to blood and/or body fluids at least once, the HIV infection was related to the profession in the 57% of the HIV-positive health professionals, and the risk of developing hepatitis B infection in health professionals is 10 times more compared to the general population [12, 13]. For example, in Turkey, you can see the Crimean-Congo Hemorrhagic Fever (CCHF) and Margburg which make hemorrhagic fever and which are infected with blood.

6. Ergonomic factors

The more the harmonization is ensured between employer and work environment, the better the safety and efficiency can be provided to employees [31]. In case there is an inconsistency between the physical capacity of the laborer and the physical requirements, occupational diseases may occur [32]. Particularly, nurses are in the third row after heavy industry workers and the heavy vehicle drivers who can experience the musculoskeletal system problems [8, 33]. According to the study performed in Turkey in which the prevalence of low back pain in the last 12 months and related factors were examined, it has been shown that the prevalence of low back pain in the last 12 months was at a high level that affects the working life (73.3%) [34]. In another study, we have indicated that the frequency of the low back pain in the past 1 year was 58.3% in nurses and health officers and 33.0% in the sick nurses [35].

7. Psychosocial factors

Job satisfaction explains the harmony between the expectations of the employee from the institution and the profession and the opportunities offered to employee. The job satisfaction is one of the factors, which affects the burnout which has severe outcomes particularly in professions which provide the service directly to human. An intense burnout state can lead to problems such as resigning, incompatibility in marriage and family, decreased in self-esteem,

a difficulty to concentrate and social isolation [12]. One of the factors that adversely influence the job satisfaction and lead to burnout in the workplace is violence. A violence, which has affected the health of health professionals recently, can be observed as a problem in every health institution and health professional [8]. The violence in a health institution is defined as a verbal or behavioral threat, physical or sexual assault [36]. It has been increasingly more accepted that the health professionals, who must contact directly with individuals in difficult situations due to their deteriorated health status, are the most important target and victim of the occupational violence among all professions [37, 38]. For instance, in Turkey, totally five doctors were killed in the past 10 years due to the violence in hospitals. The names of the doctors were as follows: Prof. Dr. Göksel Kalayci (11th of November, 2005), Dr. Ali Menekse (15th of January, 2008), Dr. Ersin Arslan (17th of April, 2012), Dr. Melike Erdem (30th of November, 2012), Dr. Kamil Furtun (29th of May, 2015) and Aynur Dagdemir (19th of November, 2015) [2]. It has been estimated in some studies that the risk of exposure to violence of particularly health professionals by patients, families of patients or others is 4–16 times more compared to other employees in various sectors (such as guards, police officers, bank employees, retail workers, those working in the transport sector) [39].

According to the 2002 report of the World Health Organization (WHO) entitled “Workplace violence in the health sector,” the International Labor Organization (ILO) and the International Union of Nurses (ICN), it has been reported that more than 50% of the health professionals are exposed to violence [40]. In this report, generally 3–17% of the health professionals were exposed to physical, 27–67% of them were exposed to verbal, 10–23% of them were exposed to psychological, 0.78% of them were exposed to sexual and 0.8–2.7% of them were exposed to ethnical violence [41]. The violence has long-term impacts on health professionals such as despondency, job loss, discontentedness, decreased job satisfaction, anxiety, life-threatening injury, restlessness, anger, stress disorder, nightmares and sleep problems. The violence in the workplace not only affects the employee but also influences the colleagues, family and friends of the individual [42–47].

The studies performed on the workplace violence have shown that the psychological violence has reached to more dangerous levels compared to physical violence. Psychological violence in the workplace (mobbing) is defined as systematic and hostile attitudes of one or several people toward one individual with unethical communication. Mobbing is performed generally by management team, but it can be directed also by colleagues, subordinates or a group of employees. It has been specified that health professionals particularly nurses are seriously a risk group exposed to mobbing in workplace [48, 49]. Mobbing leads to excessive stress, exclusion, anxiety, digestive system problems, sleep disorders, depression, anxiety, job dissatisfaction and burnout [48–52].

8. Economic aspects of occupational health and safety

Industrialization and technological developments lead to occupational injuries and environmental risks which cause socioeconomic losses not only in Turkey but also in various countries including European countries [53, 54]. Even though there are precautions taken against

occupational risks in developed European countries, occupational accidents and diseases due to profession have not been prevented for long years. This indicates that it is hard to overcome occupational disease and accidents. On the other hand, the gradual decrease in the occupational accidents and diseases related to profession in European countries in the past 10 years show us the importance of the application of the precautions. In this regard, when we consider the outcomes of our country, we should support the regulations in the workplace, create the incentive systems, ensure effectiveness of Occupational Health and Safety Workers' Representation and Occupational Health and Security Committees, and increase the trainings in order to foster social consciousness instead of waiting the employees and employers to apply these rules [53]. According to ILO, it has been reported that there is 1.25 trillion dollars loss each year due to the OHS problems [55]. In Turkey, the loss of only social security systems has been reported as approximately 4 million Turkish Liras per year [56]. According to the report of Turkey Statistical Institute (TSI) 2007 Gross Domestic Product values, the total costs of occupational accidents in Turkey are almost 35 billion Turkish Liras per year [57].

9. Occupational health and safety services for health professionals in Turkey

The Central Council of the Turkish Medical Association initiated first studies about the health status of health professionals in Turkey in 1989 with the slogan entitled "This is our health." Then, a database on the subject was aimed to be established [58]. The requirement of a committee, which should carry out the studies regarding the health and safety of employees working in the hospital, was discussed in 1999–2000, and the pilot studies were initiated, but these studies were not completed. The precautions were compiled intended for the safety of the health professionals in the 15th item of the "Notification on Principles and Procedures related to Ensuring the Patient and Staff Safety and Protection in Health Institutions" which was approved in 29th of April, 2009. In a sense, this document created a basis for the establishment of the related OHS unit [59, 60].

The concept of OHS services is defined by the USA Occupational Safety and Health Administration (OSHA) and National Institute of Occupational Safety and Health (NIOSH) and Hospital Safety Committee (HSC). Accordingly, they are explained as first step health care which improves and protects the health of health professionals and fulfills the therapeutic care services for outpatients. An effective hospital occupational health program must include at least the following titles: recruitment examinations including a full medical history, periodic inspections, health and safety trainings, immunizations, health counseling, environmental control and surveillance, record systems of health and safety, and coordinated planning between hospital departments and services. Furthermore, the environmental control and surveillance program should be a part of the occupational health program, and required precautions should be taken by performing risk analyses [61–63].

The Association of Public Health Professionals (originally HASUDER in Turkey) Occupational Health Working Group (OHWG) performed their first activity in Gazi University, Medical

Faculty, Ankara, hosted by the Chief of Medicine in 18th of September, 2010. The title of the activity was "Health Organization Workshop of Health Professionals in Hospitals." In the meeting organized by HASUDER and OHWG in 2010, the problems of hospitals' OHS units were discussed. It was stated that the basic problem was financing. Since it was not written in the Health Communication Notification (HCN), it was decided that employers should pay the costs in case the payment is a burden to employees. It has been emphasized that the committees in hospitals still need a consensus about organization, function and finance [64].

Public health professionals had opportunity to take advantage of occupational health and safety services with the help of "Regulation on the Provision of Patient and Staff Safety" published by the Ministry of Health in 6th of April, 2011, in Official Gazette and the "Occupational Health and Safety Law" published by Ministry of Labour and Social Security in 30th of June 2012 in Official Gazette [62]. Later, hospitals were informed about the implementation of regulations and establishment of the employee safety unit via instructions issued in 14th of May, 2012 [63]. In the HASUDER-OHWG workshop hosted by Antalya Akdeniz University, Medical Faculty, between 13th and 15th of September, 2012, organization of employee health units, functions of these units and financing topics were discussed and a model was established by receiving the contributions and recommendations of the participants. In this workshop, the aim was to recommend a model about the organization of OHS units which are newly established or to be established in the future, functions of these units and financing. It was also aimed to notify the institutions and create a common language in terms of naming of the concepts in order not to complicate the issues [65].

10. Conclusion and recommendations

Even though there are occupational health and safety units in state and private hospitals, personnels and service are still insufficient. Thus, the applications can vary from region to region, institution to institution as well as person to person [61]. In this regard, as in various European countries, it can also be efficient in Turkey in case the government controls the services for health professionals and if these services are provided independent of the requests of individuals [63]. The health of the health professionals also affects the health of the community. When we consider the regional differences of hospitals (such as technical equipments, staff and quality of services), which as an emerging economy, it is very important to apply the regulations that are specified by national laws and procedures across the country including the public and private health sector. Additionally, it is also crucial to decrease the exposure to occupational risks of health workers [66].

Occupational health and safety is very crucial in terms of the resource allocation. In case a portion of the economic resources can be allocated to OHS trainings and organization, the efficiency and increments in the production due to the application of OHS regulations can accelerate the economic growth and the development [67]. The importance of OHS precautions has increased due to the understanding that the costs that eliminate the harm of occupational accidents are higher than the costs that prevent the occupational accidents [68].

11. Protection from risks in a workplace for health professionals

The things which must be done at workplace:

1. The employment of necessary staff (doctors, work safety experts and other technical staff) must be made paying attention to the legal rules.
2. The health security council at work must be formed and the continuity of its meetings must be gained.
3. The sources of danger at work must be mentioned.
4. The evaluation of risks at work must be made.
5. When making risk evaluation, the problems, the staff who are responsible and the solution suggestions must be mentioned with their dates.
6. The urgent situation plans and practices at work must be made.
7. The medical examinations of the staff when they start their jobs and when they return their jobs must be filed.
8. They must be given work health and security education.
9. Everything must be recorded [69].

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Conflict of interest

The authors declare that they have no conflict of interest.

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