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Characteristics of occupational hazards at the workplace of a nurse

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SUMMARY

The occupational exposure of nurses is very closely related to the specificity of the place where they carry out their work. Her workplace may be located in health centres, hospital halls, operating theatres, maternity wards, schools, nursing homes, hospices, sanatoriums, and if necessary also in the patient's home. The range of risks that can affect her health and well-being is therefore very wide. It is therefore necessary to identify them precisely and to analyse them thoroughly. The aim of this paper is to present and briefly characterize selected occupational hazards in the position of nurse.

The risk of an accident is posed by hazards such as slippery surfaces, electricity, needles, sharp instruments, glass objects, hot appliances, gases and liquids, chemicals, compressed gas, heavy objects or dangerous patient behaviour. In addition to hazardous factors, nurses are also affected by harmful or disruptive factors that lead to illness or well-being. These include stress, shift work, mobbing, infectious material, latex, medicines including cytostatics, electromagnetic fields, UV radiation, ionizing, laser and infrared radiation, cold and hot microclimate, noise, vibrations. The workload of nurses is to a large extent also influenced by ergonomic factors, mainly many hours of work in a forced position and excessive physical effort associated with lifting patients. Each of these risks, if not addressed, not only has a negative health impact in the form of work-related diseases or accidents at work, but also reduces the effectiveness of nurses' work or is a cause of malfunction.

Key words: *occupational hazards, prevention, nursing*

INTRODUCTION

Each job is done in a specific space where a specific working environment exists. Factors can occur in the working environment that will have an adverse effect on the human body. Due to the effect of hazardous, harmful or noxious factors on the human body, occupational hazards are classified as follows: Accidents resulting in injuries of various severity (light, severe and fatal accidents), sickness, diseases and occupational diseases of various severity, up to and including disability and death. The working environment of a

nurse can vary considerably depending on what she specialises in. Nurses accompany people from birth to death. They perform their work in health centres, hospital halls, operating theatres, maternity wards, schools, care and treatment facilities, hospices, sanatoriums, and, if necessary, in the patient's home. In carrying out their work, they are exposed to many risks, whether biological, physical, chemical or psychosocial. The identification of risks in the working environment increases safety for both nurses and patients. By raising awareness of the environment about potential risks, it is possible to reduce accident rates, hospital infections and the incidence of occupational or para-occupational diseases. Knowing the hazards, it is also possible to choose appropriate measures to protect employees against their negative impact on the human body, as well as to convince the personnel of the advisability of their use. All this makes work safer and therefore more attractive for those who have chosen to work as nurses. Investing in prevention saves money on accidents at work and work-related illnesses.

The aim of this paper is to present and briefly characterize selected occupational hazards in the position of nurse.

HAZARD CHARACTERISATION

Pursuant to Article 4 of the Act of 15 July 2011 on the professions of nurse and midwife, the tasks of a nurse include the provision of nursing, preventive, diagnostic, therapeutic, rehabilitation and medical rescue services. The nurse recognizes the patient's health conditions and needs, determines the type and scope of care services, performs tasks in the field of health education and health promotion. The aforementioned health services are provided in accordance with the qualifications and duties assigned to them [1].

So many activities require a lot of physical and mental effort. It also involves exposure to numerous occupational hazards. Hazard should be understood as a condition of the working environment which may cause an accident or illness [2]. These in turn may contribute to premature inability to work. Ramazzini (1633-1714), the precursor of modern occupational medicine, classified the medical professions as the second, after mining, most harmful to the health of people performing them [3]. In terms of occupational risk, nursing dominates among these professions. A Canadian study of more than 18,600 nurses found that 48 percent of them

had a workplace injury or injury from sharp objects, 44 percent had a mental aggression from patients or their families, 25 percent had a chronic spinal disorder and 9 percent had depressive episodes [4].

In 2014, 4 139 nursing staff in Poland reported 4 accidents at work, 7 of which were serious. This represented 40.7% of total accidents and 53.8% of severe accidents that occurred in the national economy section of Q- health care and social welfare. No fatalities were reported [5]. Compared to the previous year, this occupational group recorded an increase by 704 accidents in total and by 6 serious accidents [6].

Factors that can cause accidents among nurses include slippery surfaces, electricity, needles, sharp instruments, glass objects, hot appliances, gases and liquids, chemicals, compressed gas, heavy objects or dangerous patient behaviour. Examples of accidents that may occur are: slipping and falling, electric shock, choking, injury, thermal or chemical burns, explosion, injury to the spine, etc. [7].

A major challenge for the entire health care system is the industry-specific stress related to the exercise of medical professions. Overtime shift work and night work are important factors predisposing to the development of chronic fatigue syndrome [8]. There is no doubt that contact with the sick and suffering people is an emotional burden. The work related to the sphere of widely understood assistance to other people is particularly predisposed to the appearance of dangerous symptoms of occupational burnout [9]. Studies conducted so far in various parts of the country indicate that symptoms of occupational burnout were observed in 70 to even 90% of nurses [10-11]. In therapeutic entities, an inappropriate management style is a frequent source of stress. Research conducted by the International Labour Organisation shows that bullying in the health care system is a common problem. Most often, nurses are the victims of it. This is three times more frequent than other healthcare workers. Specialists from the Nofer Institute of Occupational Medicine in Łódź estimated the risk of bullying among nurses at approx. 17%. Psychological behaviours are most frequently perpetrated by superiors (40%) and co-workers (25%) [12]. Another psychosocial risk in medical professions, especially in nursing, is the imbalance between the effort put into the job and the salary received (reward). Research shows that this problem also applies to people performing managerial tasks [13].

When nursing a patient in a hospital, nurses have continuous contact with blood and other potentially infectious body fluids of the patient. Direct contact with sick people creates the risk of contracting infectious diseases. Not all of them are recognised and classified as occupational diseases. Among nurses, the most common infections are with HCV, HBV, HIV and tuberculosis mycobacteria [14]. Most of the diagnosed infections are caused by the injured or cut with a sharp tool, followed by the spillage of mucous membranes with infectious material [15-16]. The undertaken preventive actions, i. e. : use of protective gloves and disposable equipment, personnel vaccination, improvement of disinfection and sterilisation processes, compliance with hygiene rules, implementation of post-exposure procedures, conducting training on biological hazards, allow to reduce the number of hospital-acquired infections, including infections of medical personnel [17].

A major challenge for the health protection of nurses is the risk of simultaneous exposure to several harmful agents. In addition to biological agents, there may be, for example, chemical agents, among them allergenic agents. Exposure to several factors at the same time increases the likelihood of disease development, makes it harder and more difficult to treat. Among nurses, this can happen as a result of simultaneous exposure to allergenic agents (e. g. latex) and pathogenic micro-organisms. Allergic skin lesions, which often occur around the hands, are exacerbated by changes in the bacterial flora of the skin, both saprophytic and pathogenic. Overlapping allergies can also occur as a result of exposure to several harmful agents. For example, the disease symptoms may first occur as a result of exposure to disinfectants, and then as a result of wearing latex gloves [3].

In the Polish population, the prevalence of latex allergy does not exceed 1%. In risk groups, including those with occupational exposure, this indicator is higher. In Poland, depending on the research to date, this problem concerns from 5. 9% to 18. 3% of health care workers. Worldwide, the average incidence of latex allergies is 4. 3% for the general population and 9. 7% for healthcare workers, respectively. Among nurses, exposure to latex occurs through the use of protective gloves and medical equipment, such as plasters, elastic bandages, drains, catheters, anaesthetic equipment. Frequent contact with latex-based products occurs in the treatment and intensive care units. The allergenic properties of latex products increase during their production. During the vulcanization of the rubber, high temperatures destroy the proteins of the milk, leading to a change in the composition of the allergens in the latex. Allergic properties may also be demonstrated by: chemicals added

during the production process to accelerate vulcanization, anti-ageing compounds and powdery substances facilitating the wearing of gloves [18-20]. Apart from latex, a common source of allergy among nurses are medicines, mainly antibiotics (neomycin, penicillin, ampicillin, colastine, cephradine, streptomycin). According to the latest world literature, about 17% of employees of the health care system are allergic to cephalosporins. Drugs such as omeprazole or tetrazepam, although they rarely cause allergies in patients, are a common cause of allergic reactions in medical personnel. This is due to the fact that the staff is exposed to them by inhalation or through direct contact with the skin, and it is these absorption mechanisms that proved to be the most allergic in this case [21]. Occupational exposure to cytostatic drugs is highly controversial. The International Agency for Research on Cancer (IARC) considers them to be carcinogenic. Studies conducted so far among nurses professionally exposed to cytostatic substances suggest that they have genotoxic effects on the staff organism [22]. Other studies have shown that with increased exposure to cytostatic agents (nurses' seniority), the risk of cardiovascular disease increases [23]. Long-term exposure to low doses of other chemical substances present in the nursing workplace (anaesthetic gases, disinfectants, sterilizers, formaldehyde) may result in dangerous lesions in their bodies [24].

In medical subjects, the harmful occupational factors include physical factors, i. e. electromagnetic field, UV, ionizing, laser and infrared radiation, cold and hot microclimate, noise, vibrations [25]. The workload of nurses is largely due to ergonomic factors, mainly long hours of working in a forced posture and excessive physical effort to lift patients. As a consequence, many of them suffer from musculoskeletal disorders [26].

Nursing is one of the most female-dominated professional groups. When analysing risks at the workplace, it should be borne in mind that the same factors may affect the body of a woman and a man differently. Risk assessment should take into account the individual exposure of the female body to different risk factors and the psychophysical capacity to cope with workloads. Women cannot work under certain conditions. In order to protect their health, the Ordinance of the Council of Ministers of 10 September 1996 on the list of works prohibited for women [27] was issued. Studies show that women are more likely than men to face psychosocial pressures. It is they who are more likely to be the victims of sexual harassment, harassment and intimidation in the workplace. Men are more likely to experience physical violence at work [28].

A European study on early school leaving has shown that nurses are not satisfied with their work. Nearly 16% of them consider giving up their profession several times a month, and as a reason they do not state the nature of their work, but the conditions in which they have to do it every day. Therefore, it may be concluded that if they were provided with appropriate working environment conditions, which guarantee safety and health and enable them to effectively cope with everyday challenges, they would remain economically active for a longer period of time [8].

SUMMARY

This overview illustrates selected risks at the workplace of the nurse. The range of risks is very wide, therefore it is necessary to identify them accurately and to analyse them thoroughly. On the basis of the present study, it can be concluded that the work in the nursing profession involves numerous threats of biological, chemical, physical and psychosocial nature. Not only do they have negative health effects in the form of occupational diseases or accidents at work, but they also reduce the effectiveness of nurses' work or cause errors in their performance. A detailed analysis of the factors that pose a threat to the practice of nursing and those that most influence the difficulty of working with all its consequences allows for a better understanding of the importance of the issues at stake. This should result in a better preparation of both the workstations themselves and the candidates for the profession, as well as of experienced professional nursing contractors, and this should consequently eliminate or at least reduce the effects of the feeling of occupational hazards.

LITERARY ACTIVITY

1. Ustawa z dnia 15 lipca 2011 r. o zawodach pielęgniarki i położnej. Dz.U. nr 174 poz. 1039 z późn.zm.
2. Rozporządzenie Ministra Pracy i Polityki Socjalnej z dnia 26 września 1997 r. w sprawie ogólnych przepisów bezpieczeństwa i higieny pracy. Dz.U. nr 129 poz. 844 z późn.zm.

3. Kowalczyk K., Krajewska-Kułak E., Ostapowicz-Vandame K., Kułak W.: Narażenie na czynniki niebezpieczne i szkodliwe w pracy pielęgniarek i położnych. *Problemy Pielęgniarstwa* 2010;18(3):353-357.
4. Kondro W.: The hazards of nursing. *Canadian Medical Association Journal* 2007;176(4):437.
5. Główny Urząd Statystyczny, Wypadki przy pracy w 2014 roku. Warszawa 2015.
6. Główny Urząd Statystyczny, Wypadki przy pracy w 2013 roku. Warszawa 2014.
7. European Agency for Safety and Health at Work, Jong T., Bos E., Pawłowska-Cyprysiak K., Hildt-Ciupińska K., Malińska M., Nicolescu G., Trifu A., Current and emerging issues in the healthcare sector, including home and community care, European Risk Observatory Report. Luxembourg 2014.
8. European Commission, Occupational health and safety risks in the healthcare sector. Luxembourg 2011.
9. Wilczek-Rużyczka E.: Wypalenie zawodowe pracowników medycznych. Wolters Kluwers SA, Warszawa 2014, s. 76-80.
10. Krakowiak J., Stelmach I., Rzeźnicki A., Kowalska A., Białecka J., Stelmach W.: Rozpowszechnienie zjawiska wypalenia zawodowego wśród pielęgniarek wyzwaniem dla kadry zarządzającej szpitalem. *Przedsiębiorczość i Zarządzanie* 2015;16(10):39-50.
11. Nowak-Starz G., Kozak B., Zdziebło K.: Wpływ stresu związanego z pracą zawodową na występowanie zespołu wypalenia zawodowego u pielęgniarek pracujących w oddziałach zabiegowych i zachowawczych. *Studia Medyczne* 2013; 29(1):15–21.
12. Instytut Medycyny Pracy im. prof. J. Nofera, Merez D., Mościcka A., Drabek M.: Mobbing w środowisku pracy. Charakterystyka zjawiska, jego konsekwencje, aspekty prawne i sposoby przeciwdziałania. Łódź 2005.
13. Nourry N., Luc A., Lefebvre F., Sultan-Taieb H., Bejean S.: Psychosocial and Organizational work environment of nurse managers and self-reported depressive symptoms: cross-sectional analysis from a cohort of nurse managers. *International Journal of Occupational Medicine and Environmental Health* 2014; 27(2):252–269.

14. Kuriata E., Felińczak A., Grzebieluch J., Szachniewicz M.: Czynniki szkodliwe oraz obciążenie pracą pielęgniarek zatrudnionych w szpitalu. Część II. Pielęgniarstwo i Zdrowie Publiczne 2011; 1(3):269-273.
15. Jurczak A., Sienkiewicz W., Korzonek M., Wieder-Huszla S., Augustyniuk K., Grochans E.: Zakażenia wirusami hepatropowymi wśród personelu medycznego. Family Medicine & Primary Care Review 2012; 14(3): 373–375.
16. Baran M., Wójtowska-Mach J.: Ekspozycja zawodowa z udziałem materiału potencjalnie zakaźnego w Szpitalu Specjalistycznym im. Jana Pawła II w Krakowie. Zakażenia 2008; 8(5): 98–10.
17. Rybacki M., Piekarska A.: Zapobieganie zakażeniom krwiopochodnym u personelu medycznego. Oficyna Wydawnicza Instytutu Medycyny Pracy im. prof. J. Nofera, Łódź 2011, s. 19-80.
18. Dzieża A., Chełmińska M.: Alergia na lateks – reakcje krzyżowe. Alergologia Polska - Polish Journal of Allergology 2014;1(4):144-149.
19. Gembka K., Cichocka-Jarosz E.: Alergia na lateks – czynniki wywołujące, symptomatologia i postępowanie. Alergia Astma Immunologia 2013;18(3): 151-163.
20. Wu M., McIntosh J., Liu J.: Current prevalence rate of latex allergy: Why it remains a problem? Journal of Occupational Health 2016;58(2):138-44.
21. Whitaker P.: Occupational allergy to pharmaceutical products. Current Opinion in Allergy and Clinical Immunology 2016;16(2):101-106.
22. Ladeira C., Viegas S., Pádua M., Gomes M., Carolino E., Gomes M.C., Brito M.: Assessment of genotoxic effects in nurses handling cytostatic drugs. Journal of Toxicology and Environmental Health, Part A 2014;77(14-16):879-87.
23. Tigha-Bouaziz N., Tourab D., Nezzal A.M.: Study of cardiovascular morbidity in nurses exposed to cytostatic drugs: Multivaried approach analysis. Annales de Cardiologie et d Angéiologie 2016 ;65(3):179-84.

24. Santovito A., Cervella P., Delpero M.: Chromosomal damage in peripheral blood lymphocytes from nurses occupationally exposed to chemicals. *Human & Experimental Toxicology* 2014;33(9):897-903.
25. Kujawa A., Kaczocho M.: BHP w służbie zdrowia. Wydawnictwo C.H. Beck Sp. z o.o., Warszawa 2014, s.102-122.
26. Nkhata L.A., Esterhuizen T.M., Siziya S., Phiri P.D., Munalula-Nkandu E., Shula H.: The Prevalence and Perceived Contributing Factors for Work-Related Musculoskeletal Disorders Among Nurses at the University Teaching Hospital in Lusaka. *Science Journal of Public Health* 2015; 3(4): 508-513
27. Rozporządzenie Rady Ministrów z dnia 10 września 1996 r. w sprawie wykazu prac wzbronionych kobietom. Dz.U. nr 114 poz. 545 z późn. zm.
28. European Agency for Safety and Health at Work, New risks and trends in the safety and health of women at work European Risk Observatory A summary of an agency report. Luxembourg 2013.