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Research Article

INVESTIGATION OF SHARPS INJURIES AND CONTAMINATION CAUSES

Kesici Delici Alet Yaralanmaları ve Kontaminasyon Nedenlerinin İrdelenmesi

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ABSTRACT

In this study, it was aimed to statistically evaluate the work accidents of the health personnel working in the hospital in terms of stab wounds and exposure to blood and body fluids. The number of health personnel subject to this research is 33398 in total. The data were obtained from the hospital quality and OHS unit statistics on a monthly basis. According to the data obtained, the number of people exposed to sharps and stab wounds reported annually is 54. When this number is evaluated together with the total number of employees, it corresponds to 1.59% proportionally. The number of employees exposed to splashes of blood and body fluids is 14 (0.41%). These rates are quite low when compared to data from most countries. Among the main reasons for this situation may be the well-educated and conscious health personnel, the employment of sufficient number of personnel in critical services in the hospital, and the correct health policies of our country. In order to reduce these rates even lower, it would be good to provide appropriate training to the health personnel who have the highest number of occupational accidents, and to take the necessary precautions and plan the trainings in the services where the rate of occupational accidents is high.

Keywords: General Surgery, Percutaneous Injuries, Occupational Accidents, Body Fluids and Blood Products, Infectious Diseases, Contamination, Operating room.

ÖZET

Bu araştırmada, hastanede çalışan sağlık personelinin delici kesici alet yaralanmaları ve kan ve vücut sıvılarına maruz kalmaları bakımından geçirdikleri iş kazlarının istatistiksel değerlendirilmesinin yapılması amaçlanmıştır. Bu araştırmaya konu olan sağlık personeli sayısı toplamda 33398'dir. Veriler aylık olarak hastane kalite ve isg birimi istatistiklerinden sağlanmıştır. Elde edilen verilere göre yıllık raporlanan kesici delici alet yaralanmalarına maruz kalan kişi sayısı 54'dür. Bu sayı toplam çalışan sayısı ile birlikte değerlendirildiğinde, oransal olarak %1,59'a denk gelmektedir. Kan ve vücut sıvılarının sıçramasına maruz kalan çalışan sayısı ise 14'dür (%0.41). Bu oranlar çoğu ülkeden elde edilen veriler ile karşılaştırıldığında oldukça düşüktür. Bu durumun temel nedenleri arasında sağlık personelinin iyi eğitimli ve bilinçli olması, hastanede kritik servislerde yeterli sayıda personelin çalıştırılması ve ülkemizin doğru sağlık politikaları olabilir. Bu oranların daha da aşağılara indirilmesi için en çok iş kazası yaşayan sağlık personellerine uygun eğitimlerin verilmesi ve iş kazalarının oranının yüksek olduğu servislerde gerekli önlemlerin alınması ve eğitimlerin planlaması iyi olacaktır.

Anahtar Kelimeler: Genel Cerrahi, Delici- Kesici Alet yaralanmaları, İş kazaları, Vucut Sıvıları ve Kan Ürünleri, Bulaşıcı Hastalıklar, Kontaminasyon, Ameliyathane.

1. INTRODUCTION

Occupational health and safety is a global issue. More than 3.2 million people die each year as a result of work-related accidents and diseases. In addition, 160 million new cases of occupational diseases and 300 million non-fatal occupational accidents occur each year. The economic burden of work-related illness and death and the loss of productivity account for 4% of global GDP. Therefore, providing and promoting a safe and healthy work environment should be a priority [1]. As a line of business, there are fewer occupational accidents in the field of health services than in other production sectors. The main reason for this is that there is service production instead of a material product in the field of health, and the absence of construction equipment and production lines in health care institutions (2).

This study was carried out to evaluate the occupational accidents that health personnel are exposed to. Health personnel who aim to provide health services to the community are exposed to occupational risks and work accidents due to the characteristics of the service. Occupational accidents in the health sector in Europe are 34% higher than the average of occupational accidents in the whole of Europe (3). While it is 9.4 in the health sector, it is 6.3 in the mining sector (4). It is humanely, socially, psychologically, and economically important that health personnel lose their health, become disabled, or be exposed to income deprivation due to occupational accidents as a result of the risks and dangers arising from the nature of health services (5). For this reason, it is important to evaluate the work accidents experienced in the past in order to prevent the reoccurrence of occupational accidents in health institutions, to determine our strengths and weaknesses, and to take necessary precautions (6). The most important reason why heavy work accidents do not occur in the hospital environment is the use of dangerous work machines and risky equipment (7). Outpatient treatment is offered in outpatient clinics in health institutions. Violence to which healthcare personnel are exposed in outpatient clinics is rarely observed, and occupational accidents experienced by healthcare personnel in services, operating rooms, dialysis units, blood transfusion centers, and emergency outpatient clinics where inpatients are treated are not caused by the diagnosis and treatment equipment used in those departments (8). In the aforementioned hospital departments, it can be in the form of a syringe needle puncture during the administration of intravenous or intramuscular medication by the healthcare personnel before the patient is admitted to the service (9). Another service where injection needle sticks are experienced is emergency polyclinics. Vascular access is a necessity in patients whose life stabilization is impaired, who are in shock, whose treatment is started due to high or low blood pressure, and who have lost fluid due to diarrhea or digestive system problems. In addition, the administration of intramuscular and intravenous drugs that outpatients should take is usually performed by emergency room nurses (10). Considering the other inpatient services, thousands of IM and IV injections are performed in a day in a medium-sized hospital. Another occupational accident experienced by healthcare personnel in the hospital environment is the stinging and cuts in the hand that occur during surgical procedures. Cuts and injuries on the hand caused by the surgical equipment used during surgical procedures applied in cases where body integrity is impaired due to sharp and puncture wounds that are frequently transferred to the emergency department or work accidents and traffic accidents can be given as examples (11-12). Although rare, such injuries may occur during surgical operations of physicians in operating rooms. The third group of occupational accidents that occur in hospitals are infectious diseases caused by contact with the body fluids of the patients. Risky materials such as blood, urine, saliva, serum, semen, abscess, and birth fluid pose a great risk for health personnel working in emergency services, inpatient services, dialysis and blood collection services and laboratories. Although healthcare personnel are generally exposed to patient body fluids during treatment, they may also be exposed to these fluids during transport to the laboratory and analysis by laboratory personnel (13-14).

In this context, this research aims to make a statistical evaluation of the occupational accidents experienced by the healthcare personnel working in the hospital where we work due to needle sticks, surgical instrument sharps injuries and exposure to patient body fluids.

The results of the study will reveal how we are in terms of work accidents, both in our country and in the world.

2. MATERIAL AND METHOD

Data subject to the research Kartal Dr. Lütfi Kırdar City Hospital emergency service, laboratory, clinic, blood center, blood collection, emergency, operating room, intensive care, endoscopy units contain form and statistical data transferred to the hospital quality unit. The distribution of the event according to the type of event was evaluated in the categories of events in which personal protective equipment was used, events that occurred with a contaminated device of unknown origin, events that occurred with a contaminated tool from a patient with a known blood-borne infection, and events without blood-borne infectious disease in a kanon source. Body fluids such as blood, urine, feces, sputum, percutaneous fluid, which hospital staff are exposed to, were evaluated. The study was carried out with the permission of the hospital ethics committee, dated 2020 and numbered 12. The form was used to determine the frequency, type and causes of exposure of employees to blood and body fluids, and to carry out improvement studies on the subject. The purpose of using these forms is to analyze the frequency, type and causes of exposure to blood and body fluids for Employees, to plan preventive actions and to ensure employee safety. The formula (number of exposure to blood and body fluids/Total number of personnel working in health care areas) x 100 was used as the rate calculation method. In addition, in the statistics obtained, occupational proportional distribution of employees exposed to blood and body splashes, Distribution of blood and body fluids according to the type

of fluid splashed on the exposed employee, Injury rates of employees exposed to blood and body splashes by the scene, Body area of the employee exposed to blood and body splashes. According to the distribution ratio and personal protective equipment usage rates in injured personnel were used. A statistical evaluation form was used as a measurement tool developed to determine the frequency, shape and causes of sharps/stab wounds and to carry out improvement studies on the subject. The formula was used to calculate the rates of stab wounds in the period and sub-periods (Total number of stab wounds reported/Total number of personnel working in health care areas) x 100. In addition, occupational proportional distribution of employees who are exposed to sharps and stab wounds, Proportional distribution of sharps that cause stab wounds, Rate of injury with contaminated sharps, Rates of sharps and injuries on the basis of departments, Personal protective equipment in injured personnel equipment utilization rates.

3. RESULTS

Annual data analysis of the number of employees exposed to blood and body fluids was made separately for each month. In January, it was determined that there were no employees exposed to splashes of blood and body fluids among 3019 employees. In February, it was observed that 1 employee among 3152 employees was exposed to splashes of blood and body fluids. Looking at the working groups, it was seen that 1 nurse among 796 nurses was exposed to blood and body fluids. It was determined that the nurse working in the Otorhinolaryngology (ENT) Clinic was exposed to splashes of sputum in her eyes and splashes of blood and body fluids. Personal protective equipment was used by the employee during the incident. In March, it was observed that 1 employee among 3553 employees was exposed to splashes of blood and body fluids. Looking at the employee groups, it was observed that 1 intern among 761 trainees was exposed to blood and body fluids. It was determined that the intern working in the Radiology Clinic was exposed to splashing of blood and body fluids by splashing biopsy fluid in his eye. Personal protective equipment was used by the employee during the incident. In April, it was determined that there were no employees exposed to splashes of blood and body fluids among 3429 employees. It was determined that there were no employees exposed to splashes of blood and body fluids among 3467 employees in May. It was determined that there were no employees exposed to splashes of blood and body fluids among 3320 employees in June. In July, it was observed that 1 employee among 3079 employees was exposed to splashes of blood and body fluids. Looking at the working groups, it was seen that 1 nurse among 767 nurses was exposed to blood and body fluids. It has been determined that the nurse working in the Intensive Care Unit was exposed to blood and body fluids splashing percutaneous fluid in her eyes. Personal protective equipment was used by the employee during the incident. In August, it was observed that 2 employees among 3030 employees were exposed to splashes of blood and body fluids. Looking at the working groups, it was seen that 1 nurse among 767 nurses and 1 technician among 320 technicians were exposed to blood and body fluids. It was determined that the nurse working in the Outpatient Clinic Blood Collection was exposed to splashes of blood and body fluids in the eye, and the technician working in the Organ Tissue Transplant Operating Room was exposed to splashes of blood and body fluids. Personal protective equipment was used by 2 employees during the incident.

In September, it was observed that 1 employee among 3225 employees was exposed to splashes of blood and body fluids. Looking at the employee groups, it was observed that 1 clinical support personnel among 779 other personnel was exposed to blood and body fluids. It was determined that the clinical support personnel working in the operating room were exposed to splashing of blood and body fluids by splashing contaminated water with solution in their eyes. Personal protective equipment was used by the employee during the incident.

In October, it was observed that 2 employees among 3656 employees were exposed to splashes of blood and body fluids. Looking at the employee groups, it was seen that 1 nurse among 773 nurses and 1 intern among 625 interns were exposed to blood and body fluids. It was determined that the nurse working in the Intensive Care Unit was exposed to splashes of blood and body fluids by splashing the remaining liquid on the ventilator line, and the intern working in the Internal Medicine Clinic was exposed to splashing of blood and body fluids by splashing blood in her mouth. Personal protective equipment was used by 2 employees during the incident.

In November, it was observed that 3 employees among 3934 employees were exposed to splashes of blood and body fluids. Looking at the working groups, it was observed that 1 nurse among 883 nurses, 1 intern among 698 interns, 1 anesthesia technician among 353 health technicians were exposed to blood and body fluids. The nurse working in the Intensive Care Unit was exposed to splashing of accumulated liquid in the

respiratory circuit and splashing of blood and body fluids on the face, The anesthesia technician in the operating room was exposed to splashes of blood and body fluids on the hands of the anesthesia technician working in the operating room, exposure has been detected. Personal protective equipment was used by 3 employees during the incident. In December, it was determined that there were no employees exposed to splashes of blood and body fluids among 3921 employees.

Annual data analysis of the number of employees exposed to stab wounds was made separately for each month. In January, it was observed that 5 employees among 3019 employees were exposed to sharp and stab wounds. When the employee groups are examined, it has been determined that 2 nurses among 794 nurses and 3 cleaners among 396 cleaners are exposed to injury, and its distribution with the relevant tool is with the needle tip. In the distribution according to the department where the incident occurred, it was observed that 2 employees were injured in the clinic, 1 employee in the emergency room and 2 employees in the intensive care unit. In the distribution according to the type of the event, it was observed that personal protective equipment was used in all 5 cases. It has been determined that 3 injuries were caused by a contaminated instrument of unknown origin, and 2 injuries were included in the events without a contagious disease through blood at a known source.

In February, it was observed that 3 employees among 3152 employees were exposed to sharps and stab wounds. When we look at the working groups, it was determined that 1 nurse among 796 nurses and 2 cleaning staff among 369 cleaning staff were exposed to injury, and the distribution with the relevant tool was 2 needle tips and 1 catheter. In the distribution according to the department where the incident occurred, it was observed that 1 employee was injured in the clinic, 1 employee in the laboratory and 1 employee in the intensive care unit. In the distribution according to the type of the event, it was seen that personal protective equipment was used in all 3 cases. It has been determined that 2 injuries were caused by a contaminated instrument of unknown origin, and 1 injury was included in the events without a contagious disease through blood in the source of known origin.

In March, it was observed that 5 employees among 3553 employees were exposed to sharps and stab wounds. When we look at the working groups, it was determined that 2 nurses among 782 nurses, 1 cleaning officer among 369 cleaning workers, 2 interns among 761 trainees were exposed to injury, and the distribution with the relevant tool was 4 needle tips and 1 broken glass. In the distribution according to the department where the incident occurred, it was observed that 4 employees were injured in the clinic and 1 employee was injured in the intensive care unit. In the distribution according to the type of the event, it was observed that personal protective equipment was used in all 5 cases. It has been determined that 1 injury was caused by a contaminated instrument of unknown origin, and 3 injuries were included in the events that did not contain any contagious disease through blood at a known source.

In April, it was observed that 4 employees among 3429 employees were exposed to sharp and stab wounds. When the groups of workers are examined, it has been determined that 2 nurses among 778 nurses and 2 cleaners among 405 cleaning workers have been exposed to injury, and the distribution with the relevant instrument is 3 needle tips and 1 catheter. In the distribution according to the department where the incident occurred, it was observed that 1 employee was injured in the clinic, 2 employees in the emergency room, and 1 employee in the intensive care unit. In the distribution according to the type of the event, it was observed that personal protective equipment was used in all 4 cases. It has been determined that 2 injuries were caused by a contaminated instrument of unknown origin, and 2 injuries were included in the events that occurred with a contaminated instrument from a patient with a blood-borne infection at a known source.

In May, it was observed that 5 employees among 3467 employees were exposed to sharp and stab wounds. When the employee groups are examined, it has been determined that 1 doctor among 682 doctors, 1 nurse among 779 nurses, 2 interns among 480 interns, 1 cleaning staff among 405 cleaners were exposed to injury, and the distribution with the relevant instrument was 4 needle tips and 1 lancet. In the distribution according to the department where the incident occurred, it was observed that 1 employee was injured in the clinic, 1 employee in the operating room, 1 employee in the operating room, 1 employee in the endoscopy unit, and 1 employee in the intensive care unit. In the distribution according to the type of the event, it was observed that personal protective equipment was used in all 5 cases. It has been determined that 2 injuries were caused by a contaminated instrument of unknown origin, and 3 injuries were included in the incidents that occurred with a contaminated instrument from a patient with a blood-borne infection at a known source.

In June, it was observed that 3 employees among 3320 employees were exposed to sharps and stab wounds. Looking at the employee groups, it was determined that 2 nurses out of 760 nurses, 1 cleaner among 405

cleaners were exposed to injury, and its distribution with the relevant tool was caused by needle tip in 3 injuries. In the distribution according to the department where the incident occurred, it was observed that 2 employees were injured in the clinic and 1 employee was injured in the emergency room. In the distribution according to the type of the event, it was seen that personal protective equipment was used in 2 cases. It has been determined that 3 injuries were included in the events that occurred with a contaminated instrument from a patient with a blood-borne infection at a known source.

In July, it was observed that 2 employees among 3079 employees were exposed to sharps and stab wounds. Considering the employee groups, it was observed that 1 nurse among 767 nurses and 1 intern among 141 interns were exposed to injury. It was determined that 2 injuries were caused by needle tip and 1 injury was by scalpel. In the distribution according to the department where the incident occurred, it was observed that 1 employee was injured in the clinic and 1 employee was injured in the intensive care unit. In the distribution according to the type of the event, it was seen that personal protective equipment was used in 2 cases. It was determined that 2 injuries were included in the events that occurred with a contaminated instrument from a patient with a known blood-borne infection.

In August, it was observed that 1 employee out of 3030 employees was exposed to sharps and stab wounds. When we look at the employee groups, it was observed that among the 408 cleaners, 1 cleaner was exposed to injury. It was determined that 1 injury was caused by the needle tip with the related instrument. According to the distribution according to the department where the incident occurred, it was observed that 1 employee was injured in the emergency room. In the distribution according to the type of the event, it was seen that personal protective equipment was used in 1 case. It was determined that 1 injury took place in the events without blood-borne infectious disease in the source of which the source is known.

In September, it was observed that 4 employees out of 3225 employees were exposed to sharps and stab wounds. When we look at the working groups, it was observed that 1 nurse among 770 nurses and 3 health technicians among 319 other health workers were exposed to injury. It was determined that 3 injuries were caused by needle tip in 3 injuries. In the distribution according to the department where the incident occurred, it was observed that 2 employees were injured in the clinic, 1 employee in the blood draw, 1 employee in radiology, and 2 employees in the operating room. In the distribution according to the type of the event, it was seen that personal protective equipment was used in 4 cases. It has been determined that 2 injuries were caused by a contaminated instrument of unknown origin, and 2 injuries were included in the events without a contagious disease through blood at a known source.

In October, it was observed that 4 employees among 3656 employees were exposed to sharps and stab wounds. Considering the employee groups, it was observed that 3 nurses out of 773 nurses and 1 intern among 625 interns were exposed to injury. It was determined that the distribution with the related instrument was with the needle tip in 4 injuries. In the distribution according to the department where the incident occurred, it was observed that 1 employee was injured in the emergency room and 3 employees in the intensive care unit. In the distribution according to the type of the event, it was seen that personal protective equipment was used in 4 cases. It was determined that 2 injuries occurred with a contaminated instrument from a patient with a blood-borne infection of known origin, and 3 injuries were included in events without a blood-borne infectious disease in a known source.

In November, it was observed that 3 employees among 3934 employees were exposed to sharps and stab wounds. Considering the employee groups, it was observed that 1 cleaning worker among 419 cleaning workers and 2 interns among 698 interns were exposed to injury. It was determined that the distribution with the related instrument was with the needle tip in 3 injuries. In the distribution of the incident according to the department, it was observed that 3 employees were injured in the clinic. In the distribution according to the type of the event, it was seen that personal protective equipment was used in 2 cases. It was determined that 2 injuries occurred with a contaminated instrument of unknown origin, and 3 injuries were included in the events without a contagious disease through blood at a known source.

In December, it was observed that 15 employees among 3921 employees were exposed to sharp and stab wounds. When we look at the employee groups, it is seen that 2 doctors out of 790 doctors, 6 nurses out of 891 nurses, 3 cleaners out of 411 cleaners, and 1 health technician among 342 other health care workers are exposed to injury.

4. CONCLUSION

In a study conducted in California in 2014, surgical occupational accidents were observed in 55 (0.55%) of 10000 registered nurses. This is well below the 33% rate accepted as the upper limit by the United States occupational safety laws and regulations (15). In this study, when this rate is taken into account for a one-year period, it was observed that 54 healthcare workers (1.5%) out of 3398 people were exposed to stab wounds. According to Nelson & Baptiste, (2004) in the United States, this rate can go up to 76% depending on the unit and the number of nurses working in the unit annually (16). The subject of the study, Kartal Dr. Lütfi Kırdar City Hospital has 1105 beds. The number of medical personnel injuries per hundred beds per year is approximately 5. This rate was 37 per 100 beds in 1999 and 22 per 100 beds in 2001, according to the report prepared by the University of Virginia Health Personnel International Occupational Safety Center (17). In a survey conducted on 100 healthcare workers at a German medical university, the percentage of needlestick injuries was found to be 29.5% for students and 22.5% for employees (18). Clark et al. In a 2007 study of 34318 nurses working in acute care hospitals in the United States (Pennsylvania), Canada (Alberta, British Columbia and Ontario), the United Kingdom (England and Scotland) and Germany, an average of 1,000 full-time employees in the USA and Canada Injuries from sharps were observed, with rates ranging from 146 injuries per nurse to 488 injuries per 1,000 full-time nurses in the United Kingdom (England and Scotland) and Germany. In the United States and Canada, very high rates of sharp instrument injuries were observed among nurses working in the operating room and/or perioperative care (255 and 569 injuries per 1000 full-time nurses per year, respectively). When these ratios are converted into percentages, this ratio is approximately 14% in the USA and Canada, and approximately 49% in Germany and the United Kingdom. According to the findings of this study, the rate in our hospital is approximately 1.5% (19).

5. DISCUSSION

Occupational health and safety is the most important parameter to be considered in all service and production sectors. The field of health is mostly evaluated in the sub-category of health services within the service sector in working life. In developed countries, measures taken regarding occupational health and safety are expected to be implemented and regulated in direct proportion to the level of development. The rate of sharps and sharps injuries and exposure to infectious factors that health personnel working in the hospital environment are exposed to is related to the extent to which the institution implements occupational health and safety measures. As can be seen from the results of the study, the rates of occupational accidents occurring in our hospital are considerably less than the rates observed in developed countries. Among the main reasons for this situation are the sufficient number of health personnel, the working hours not being longer than they should be, the complete occupational and OHS training of the health personnel, and a correct personnel management policy.

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