

TYPICAL OCCUPATIONAL ACCIDENTS WITH EMPLOYEES OF A UNIVERSITY HOSPITAL IN THE SOUTH OF BRAZIL: EPIDEMIOLOGY AND PREVENTION

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Descriptive epidemiologic study that aimed to analyze the typical occupational accidents notified by employees of a university hospital in the South of Brazil from 1997 to 2002, and to estimate their risk indicators. A total of 717 accidents were registered; 86% of them (616) were typical and presented an annual average risk coefficient of 6.0 per 100 employees. The groups that presented more risks for accidents were cooks, woodworkers and nursing auxiliaries, while hands were the most affected area. Regarding the accidents nature, the greatest risks involved biological material. Hence, it is necessary to orient personnel about the legal aspects of occupational accidents and review work processes, especially those related to employees who perform activities at greater risk of transmissible diseases like AIDS and hepatitis B and C.

DESCRIPTORS: hospitals; accidents, occupational; occupational risks

ACCIDENTES DE TRABAJO TÍPICOS DE TRABAJADORES DE UN HOSPITAL UNIVERSITARIO DE LA REGIÓN SUR DE BRASIL: EPIDEMIOLOGÍA Y PREVENCIÓN

Se trata de un estudio epidemiológico descriptivo que tuvo como objetivo analizar los accidentes de trabajo típicos notificados por los trabajadores de un hospital universitario de la región sur de Brasil, de 1997 a 2002 y estimar indicadores de riesgo. Fueron notificados 717 accidentes, siendo 86% (616) típicos, cuyo Coeficiente de Riesgo Promedio Anual fue igual a 6,0 accidentes a cada 100 trabajadores. Los equipos que corrieron los mayores riesgos de sufrir tales accidentes fueron los de los cocineros, carpinteros y auxiliares de enfermería, siendo las manos la parte del cuerpo más afectada. En cuanto a la naturaleza de los accidentes, los de mayor riesgo fueron los relacionados a materiales biológicos. Se constató la necesidad de orientar al personal sobre los aspectos legales de los accidentes y revisar los procesos de trabajo desarrollados, especialmente para los que actúan en funciones cuyos riesgos son mayores de contraer enfermedades graves como SIDA y Hepatitis B y C.

DESCRIPTORES: hospitales; accidentes de trabajo; riesgos laborales

ACIDENTES DE TRABALHO TÍPICOS ENVOLVENDO TRABALHADORES DE HOSPITAL UNIVERSITÁRIO DA REGIÃO SUL DO BRASIL: EPIDEMIOLOGIA E PREVENÇÃO

Estudo epidemiológico descritivo objetivou analisar os acidentes de trabalho típicos notificados pelos trabalhadores de um hospital universitário da Região Sul do Brasil, de 1997 a 2002, e estimar indicadores de risco. Foram notificados 717 acidentes, sendo 86% (616) típicos, cujo coeficiente de risco médio anual foi igual a 6,0 acidentes a cada 100 trabalhadores. As equipes que correram os maiores riscos de sofrer tais acidentes foram as de cozinheiros, marceneiros e auxiliares de enfermagem, sendo as mãos a parte do corpo mais atingida. Quanto à natureza dos acidentes, aqueles de maior risco foram os que envolveram materiais biológicos. Constatou-se a necessidade de orientação do pessoal sobre os aspectos legais dos acidentes e revisão dos processos de trabalho desenvolvidos, especialmente para os que atuam em funções cujos riscos são maiores para contrair doenças graves como AIDS e hepatite B e C.

DESCRITORES: hospitais; acidentes de trabalho; riscos ocupacionais

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INTRODUCTION

Research on occupational accidents (OAs) that affect health workers represents an important epidemiological surveillance tool and aims to base the planning and management of health services in order to provide decent work conditions to those who deliver care to society.

According to the Brazilian legislation, OA is the accident that occurs during the performance of work and, as a consequence, causes body lesion or functional disturbance, with permanent or temporary loss or reduced capacity to work, or even death. Accidents that occur during the work per se are considered *typical occupational accidents* (TOA), those that occur during transportation from home to work are considered *commuting accidents*, and *professional disease* is produced or triggered by the exercise inherent to the activity itself, and finally, *occupational disease* is acquired or triggered by special conditions the work is performed in and which it is related with. All OAs should be registered in the social security authorities through the Information on Occupational Accidents (CAT)⁽¹⁾.

OAs are hazards to workers' health due to labor activity, environmental conditions where the work is performed, the worker's physical and mental characteristics, social, economic and political contexts. They are caused by an abrupt or insidious rupture in the relation health-work and interfere in the worker's health-disease process, with substantial personal and social repercussions.

Although apparently contradictory, hospitals themselves present several risks to their own workers, both in care delivery to patients and in support to health care services⁽²⁾, despite hospitals' social obligation to deliver care to workers severely injured in accidents.

Hospital institutions are inserted in the tertiary economic sector, directly or indirectly complying with the logic of the capitalist process. While many private hospitals are focused on the search for production and profit, whose model reflects on inadequate remuneration and work conditions, problems of management, financial, and personnel are also frequently verified in public hospitals, which eventually reflect on their personnel's work process.

Even if in an unspecific manner, the Brazilian labor legislation has presented advancements in the last decades on issues related to the safety and health of workers in the health area. On the positive side,

standards of adequate conditions hospital work should be performed in, were regulated through Regulatory Standard 32, of Safety and Health at Work in Health Care Institutions (NR-32)⁽³⁾.

Occupational hazards are classified in biological, physical, chemical, mechanic, physiological and mental, and exposure to these risks can lead to OAs. Hospital workers, especially those who deliver direct care, are exposed to these risks because of their close contact with patients with infectious diseases, the need to move patients and heavy equipments, physical stress due to the rhythm, organization and division of work, in addition to experiences of pain and death they share, among others, which lead to different kinds of stress. However, there is a considerable number of other workers, equally exposed to risks, who should be taken into account. They work in technical and logistic support to hospital care, like laundry, building maintenance and equipment, storing, material and equipment dispensing and janitorial service.

The risk of being infected by Acquired Immune Deficiency Syndrome (AIDS) and Hepatitis B is among the most feared by hospital workers, especially in consequence of accidents with contaminated needles, whose indices of infection have been estimated at between 0.25 and 0.4% for the Human Immunodeficiency Virus (HIV), between 6 and 30% for hepatitis B virus (HBV), and between 0.4 and 1.8% hepatitis C virus (HCV)⁽⁴⁻⁵⁾. The Ministry of Health (MS) stresses that permanent preventive measures, through the adoption of Universal Precautions, are the best alternative to preserve the health of workers exposed to these occupational risks⁽⁶⁾.

Aiming to know and work on this issue, in 1998, the State of Paraná, in the South of Brazil, implemented the program of Notification of Occupational Accidents involving Biological Material (NATMB), through the use of a specific notification form, elaborated not only in accordance to the CAT (Information on occupational accidents) but also according to the MS recommendations. The MS determined the use of two notifications (NATMB and CAT) when this type of accidents occurs, and free distribution of anti-retroviral drugs for HIV, as well as others to prevent hepatitis B⁽⁶⁾.

As from the 1990's, several authors have focused on this issue, especially in studies on OAs due to the handling of piercing-cutting material and potentially contaminated biological material. Nevertheless, few

studies focusing on the totality of OAs in hospitals have been carried out in Brazil, possibly because of the diversity of work processes developed in hospitals.

OBJECTIVE

Analyze the notified TOAs that affected workers at a Teaching Hospital (TH) in the South of Brazil between 1997 and 2002, according to the variables: type of accident, injured worker's function, nature of the accident, part of the body injured, time and number of hours worked until the moment of the accident; and estimate risk indicators of these occurrences.

MATERIAL AND METHOD

This is a descriptive epidemiological and cross-sectional study, based on Classical Epidemiological theory. The TH under study is a facility with hospitalization capacity of 333 beds, fully

available through the SUS (Brazilian Single Health System), and a staff of 1,742 collaborators⁽⁷⁾. The study was approved by the Research Ethics Committee at the university the hospital is linked to.

Data collection was carried out through the official notifications of OAs (CATs and NATMBs) obtained from the institution's offices responsible for this information. For statistical tabulation and analysis, Epi-Info version 6.04 and Excel electronic spreadsheet were used. The Coefficient of Risk (CR) of the study variables was estimated, considering the ratio between the number of OAs that occurred at a certain moment and the population exposed to the risk at the same time and place.

RESULTS

Between 1997 and 2002, the study period, 717 OAs were notified at the TH, according to the classification presented in Table 1.

Table 1 – Annual distribution of OAs with the TH workers, by type of accident, from 1997 to 2002. Londrina, 2004

Type of accident	1997		1998		1999		2000		2001		2002		Total		Total annual average		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	Nº of workers* CAAR**	
Typical	95	84.1	139	93.9	108	91.5	135	88.2	66	88.0	73	66.4	616	85.9	102.7	1709.8	6.0
Commuting	18	15.9	9	6.1	10	8.5	18	11.8	8	10.7	18	16.4	81	11.3	13.5	1709.8	0.8
Professional Disease	0	0.0	0	0.0	0	0.0	0.0	0.0	1	1.3	19	17.3	20	2.8	3.3	1709.8	0.2
Total	113	100	148	100	118	100	153	100	75	100	110	100	717	100	119.5	1709.8	7.0

n = number of OAs; *N of workers: number of workers at the work unit⁽⁷⁾; ** CAAR: coefficient of risk – ratio between average annual number of OAs and average number of exposed workers. It provides the probability of the accident to occur

Results show a higher Coefficient of Annual Average Risk (CAAR) of *typical occupational accidents (TOAs)*, of 6.0 accidents for each 100 workers, followed by the coefficient of *commuting accidents* (CAAR equal to 0.8) and the *coefficient of professional diseases*, with much lower levels (CAAR equal to 0.2). The latter presented a considerable increase in 2002 due to a patient hospitalized with scabies mite (*Sarcoptes scabiei*) in the emergency care. He infected workers whom he had had contact with and those who had handled contaminated material used in direct care (Table 1).

In the year-by-year analysis of CR, an expressive reduction in the TOA indicator was verified in the last two years (Figure 1). It can be due to preventive measures implemented in the hospital,

under-notification of cases, or yet, the strike that occurred between September 2001 and February 2002. The strike affected only the outpatient services, while hospitalization, emergency care and other services of high complexity were not interrupted.

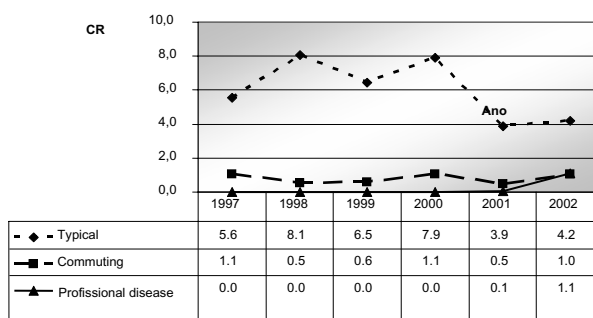


Figure 1 – Annual distribution of CR of OAs that occurred among TH workers, according to their type

Functions in which there were higher risks of typical accidents at the TH were: cook, woodworker, nursing auxiliary, laboratory auxiliary and janitor. It evidences the need for special attention to these workers and to the way work is organized and performed. Many times, cooks were injured when using knives, handling machines to cut vegetables and by electrical shocks due to little room in the work area or falls on wet floors. Woodworkers suffered accidents, especially when using the electrical saw, which caused cuts on their hands. The nursing personnel

were mainly injured in the handling of piercing-cutting material, in the performance of venous puncture and medication administration. In addition to accidents caused by needles in venous puncture procedures, laboratory auxiliaries suffered accidents during the exams themselves, handling materials under examination, and during the cleaning process of glass containers, especially containing blood. The janitorial personnel were injured by piercing-cutting materials inadequately disposed in the trash and in inappropriate places, whose source of contamination was invariably unknown.

Table 2 – Distribution of CR of OAs that occurred with TH workers, according to function, from 1997 to 2002. Londrina, 2004

Function	CR						CR annual average
	1997	1998	1999	2000	2001	2002	
Cook	38.5	42.9	35.7	35.7	9.1	22.2	32.0
Woodworker	16.7	14.3	28.6	14.3	0.0	16.7	15.0
Nursing Auxiliary	10.0	16.5	10.4	14.3	6.0	5.7	10.4
Laboratory Auxiliary	6.3	11.1	0.0	16.7	5.6	15.8	9.3
Janitor/ General Aid/ General Services Auxiliary	9.8	9.2	8.8	11.2	7.9	6.0	8.8
Plummer	0.0	25.0	0.0	0.0	0.0	25.0	8.3
Physiotherapist	0.0	0.0	25.0	0.0	0.0	20.0	8.0
Anatomy and Necropsy Technician	20.0	0.0	0.0	0.0	25.0	0.0	8.0
Nutrition and Kitchen Auxiliary	2.1	6.3	12.9	11.1	1.6	4.7	6.6
Laundry Auxiliary	5.8	2.0	6.0	3.9	5.8	11.5	5.9
Anatomy and Necropsy Auxiliary	0.0	33.3	0.0	0.0	0.0	0.0	5.6
Seamstress	0.0	16.7	16.7	0.0	0.0	0.0	5.6
Nursing Attendant	5.9	6.7	6.7	7.7	0.0	0.0	5.1
Office-boy	5.0	0.0	6.3	6.7	6.7	6.3	5.1
Laboratory Technician	4.8	6.5	6.8	5.7	0.0	4.8	4.8
Maintenance Officer	12.5	0.0	0.0	12.5	0.0	0.0	4.2
Physician	0.0	1.5	7.6	8.5	4.8	1.0	3.8
Driver	0.0	7.1	0.0	0.0	0.0	14.3	3.6
Nurse	0.0	6.2	3.1	4.1	4.2	0.0	3.0
Equipment Maintenance Technician	0.0	0.0	0.0	12.5	0.0	0.0	2.1
Nutricionist	12.5	0.0	0.0	0.0	0.0	0.0	2.0
Biochemical	0.0	0.0	0.0	10.0	0.0	0.0	1.7
Administrative technician/auxiliary	1.1	0.7	1.5	0.0	0.4	1.2	0.8
Porter	0.0	0.0	0.0	0.0	0.0	4.3	0.7
Radiology Technician	0.0	0.0	0.0	0.0	4.0	0.0	0.7
Total	5.6	8.1	6.5	7.9	3.9	4.2	6.0

The relevance of accidents that involved exposure to biological material in the hospital context was confirmed when analyzing the nature of accidents. These accidents were the most frequent in all years

and totalized 314 cases, presenting a CAAR of 3.1, followed by accidents with medical-hospital material (102 cases and CAAR equal to 1.0), especially needles, which presented risks to a great number of workers

at the hospital. Cases of falls, impacts and lesions due to excessive effort exerted at work were responsible for 163 OAs, presenting CAAR equal to 1.6 accidents for each 100 workers.

Hands are the most affected body part (CAAR of 3.9). Contaminated hypodermic needles presented the highest occupational risk and were responsible for 41.9% (258) of the 616 cases de TOAs, totaling a CAAR of 2.5 (Figure 2).

It is highlighted that, in 3.4% (21) of the cases, accidents occurred with HIV seropositive patients with the following characteristics: one of them was also seropositive for Hepatitis C; 57.1% (12) of accidents occurred due to piercing-cutting materials, and in 4.8% (1) the injured person cut herself. There were no notifications, through CAT, of accidents involving cuts, and of seven of the 12 accidents caused by piercing-cutting materials. Failing to register accidents leaves workers legally unprotected in case of contamination. In one case, the patient was simultaneously infected by HCV and HIV, and another patient was infected by HCB.

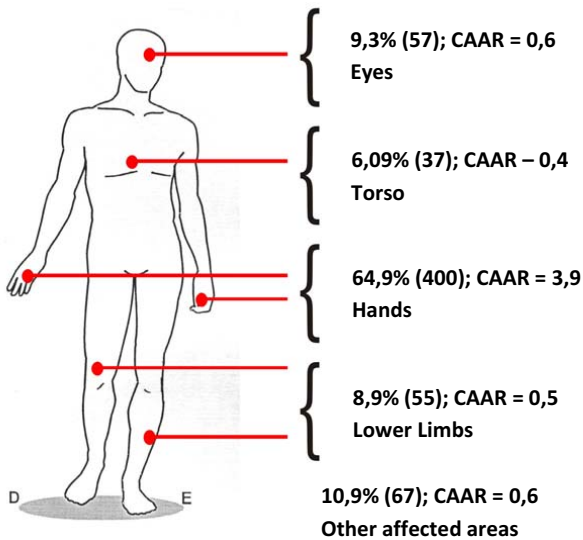


Figure 2 – Distribution of OAs that occurred with TH workers, according to body area injured in the accident from 1997 to 2002. Londrina, 2005

Regarding the time the OAs occurred and the number of hours worked until the moment of the accident, the events mostly occurred in the morning, possibly because of the higher intensity of tasks in this period, with a great volume of surgical procedures, exams, transportation of patients and different kinds of forwarding. The third hour seems to indicate a peak of activity for professionals working

six-hour shifts. The same can be said of the night period, during the organization of work in which more complex procedures are performed in order to allow patients to rest further ahead.

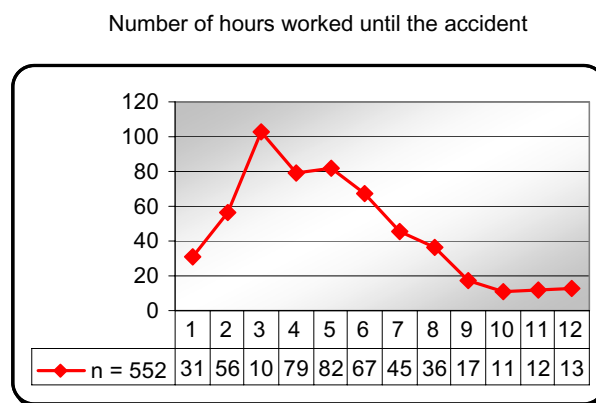
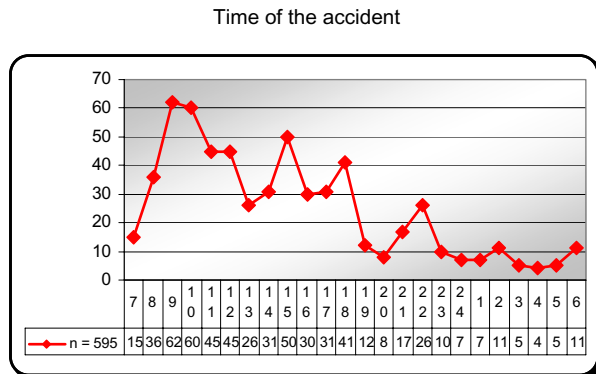


Figure 3 – Distribution of OAs that occurred with TH workers, according to the time of occurrence and number of hours worked until the accident event from 1997 to 2002. Londrina, 2005

DISCUSSION

Attention to health in the hospital environment is a collective activity that involves professionals with specific knowledge and practice in health sciences and related areas, because many of the interdependent work processes require this kind of joint work. There are few studies reporting on the whole range of OAs, possibly because of the diversity of activities and work processes developed at these institutions.

Additional difficulties are found when the study focuses on THs. The peculiarities of these institutions need to be accounted for because, in addition to the services offered to the population, they are also committed to research on new health technologies

and to technical-scientific education, besides humanistic and ethical aspects of future professionals.

In the analysis of all accidents registered by workers at the study hospital, a higher ratio of TOAs was found when compared to cases of commuting accidents and professional disease. This leads to the conclusion that the events mostly occurred in the work environment and are related to the work process. The same is observed in other studies focused on this issue in hospitals, reproducing what also occurs in the remaining sectors of society. Only in 2006, 503.890 OAs were registered in the Brazilian Institute of Social Security, with 80.0% (403,264) of TOA cases, 14.7% (73,981) commuting accidents and 5.3% (26,645) informed as occupational diseases. A fact worth mentioning is that these accidents resulted in 2,717 deaths⁽⁸⁾.

It was verified in this study that the hospital workers who exert predominantly manual activities and those in the smaller income range are the ones most affected by accidents, which is in accordance with the investigations of other Latin-American authors⁽⁹⁻¹²⁾. Higher exposure does not seem to be linked to lower professional qualification, but to the type of activities these workers perform.

In fact, exposure to workloads characterizes social division and work technique, by the way activities are divided and organized, by the great volume of tasks and repetitiveness of procedures, which can make the team feel the burden of activities and physical and emotional exhaustion in their own body⁽¹³⁾.

Several Latin-American authors have discussed the specific exposure of nursing workers to such occurrences. In fact, these professionals, especially technicians and auxiliaries, are the ones most involved in severe accidents, due to their increased occupational exposure to potentially infectious body fluids like blood, due to their physical proximity to the patient, typical of the nursing care activity, and interrupted tasks of higienization, medication administration, handling and preparation of surgical instruments after use, handling of contaminated excretions and fomites, hectic rhythm required to perform tasks in time, the way the work is divided and organized, making them more vulnerable to occupational risks and OAs, as well as hazards due to exposure^(2,9,11-12,14-18).

The high level of TOA notifications caused by biological material found in studies on OAs with hospital

workers reveals renewed attention in relation to AIDS, especially from nursing personnel. This is possibly due to the discrimination stigma this disease carries, which makes health professionals apprehensive. Although the hepatitis B virus has been known much longer and represents a higher risk of infection than HIV, with repercussions to health as significant as those from HIV, it does not provoke so great concern among professionals and society itself as AIDS does.

An occupational case of AIDS was notified in São Paulo in 1996. Since the beginning of the epidemic, from 1981 to 1999, 100 proved cases and 213 probable cases of contamination of health professionals by HIV were identified worldwide due to OAs, and the United States is responsible for the largest number of investigated cases⁽¹⁵⁾.

Regarding the body part affected in the TOAs, hands were, as expected, injured in 64.9% (400) of TOAs, with a CAAR of 3.9 accidents for each 100 workers at the TH. Eyes were another source of concern, mainly because of the exposure to biological material. This study showed ocular exposure to these elements in 85.4% (35) of cases; in 42.9% (15) of cases, the source patient was seropositive for HIV and/or hepatitis B. This is relevant because these accidents are avoidable through simple procedures like the use of goggles during secretion aspiration, surgical instrumentation, in birth care, collection of contaminated excretions and fluids, among others.

The findings of this study regarding the most affected body part in OAs are even higher than the general data presented by the Ministry of Social Security, which found that hands were affected in 32.6% (407,359) of all cases between 2002 and 2005⁽⁸⁾.

Musculoskeletal problems caused by TOAs presented in the notifications were: 28 contusions, one fracture, seven torsions, four luxations, and four muscular distensions, totaling 12.6% (44) of OA cases, whose CR was estimated at 1.1.

Many are the occupational risks, present in several activities performed in hospitals, exposing workers to musculoskeletal problems. They are particularly present in kitchens, laundries, janitorial services, laboratories, transportation of equipments, and especially in direct care delivery to the patient, due to the need to exert physical effort, the production of services in series, performance of repetitive tasks, hectic rhythm, among others⁽¹⁰⁻¹¹⁾.

Worth mentioning is the fact that, as opposed to piercing-cutting injuries, which are often considered less important, back pains are very significant. They are caused by abrupt movements, physical effort or even by supporting a patient so as not to fall, by falls, impacts and movements required to lift a bin of dirty clothes. The higher relevance of accidents makes professionals register the fact because, oftentimes, accidents prevent them from continuing to perform their work.

As expected, in the evaluation of the OAs that occurred at the hospital, it was observed that the largest number of occurrences happened during the day, especially in the morning. It seems to be related to the time when there is an intense level of work, especially care procedures. In terms of the number of hours worked until the moment of the accident, the majority of cases occurred between the third and fifth hour worked, which is possibly related to the higher volume and rhythm of work in this period and intense work in six-hour shifts, which is the system employed by the study institution. (Figure 3).

FINAL CONSIDERATIONS

The evaluation of variables that compose the daily work processes hospital workers are involved in, and especially the search for preventive measures that can be implemented to improve this reality, aiming to reach the human dimension in the work activity, are shown as alternatives for health promotion of this professional group, as recommended by the SUS.

The highest risk indicators were verified in this study for typical accidents, which affect mainly cooks, woodworkers and nursing auxiliaries. Hands were the most affected part of the body, exposed to biological material in the handling of piercing-cutting

materials. The highest frequency of events happens in the morning and at the third hour. In this perspective, all potential preventive measures able to contribute to OA prevention and health promotion of workers in hospital units should be searched for and institutionalized with the support of the Service of Engineering, Medicine and Safety at work, the hospitals' internal commissions on accident prevention, as well as all other organizational structures responsible for health education and surveillance in the institutions.

Preventive and educative actions aiming to avoid new occurrences should be a concern of all those involved, and require intense effort to inform and educate professionals and students in the area, especially to prevent OAs, which always culminate in professionals' emotional exhaustion, health risks, economic and social problems, financial investments and ethical and legal problems that involve professionals, patients and institutions, among others. It is necessary to reorient all workers regarding the current legislation, with a view to preventing undernotification cases, for their own safety, with adequate provision of legal support.

Meticulous evaluation of work processes developed in hospitals, the way the work is divided and organized, is essential in this task, especially for workers who develop functions subject to higher professional risks. It is necessary to know how the worker is inserted in the social group and the history of work processes that cause exhaustion, due to the specificities of the worker's - way of living and working⁽¹³⁾.

The range of variables that compose the hospital work requires more detailed studies, to allow for the development of sound actions of health preservation and promotion to those who dedicate themselves to care for others' health.

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