Management in occupational health: relevance of investigation of work accidents and incidents in health services

Kedma de Magalhães Lima, Kezla Glaciene dos Santos Canela, Roxana Braga de Andrade Teles, Danyella Evans Barros Melo, Lucas Rafael Monteiro Belfort, Victor Hugo da Silva Martins

ABSTRACT | Background: To ensure occupational health, promotion of working conditions likely to result in a satisfactory quality of life at work is necessary, with enhancement of the physical, mental and social well-being of workers and prevention and control of accidents and diseases by reducing risk conditions. Objective: To identify the practices and main difficulties related to occupational management in healthcare companies. Methods: A literature review was conducted in database Virtual Health Library. The search was based on the combination of keywords: occupational health management, occupational health, risk conditions and workplace safety. Scientific articles in the Portuguese language, with full text available and published from 2008 to 2016 were selected. The data were analyzed in an organized and critical manner. Results: Work accidents are a social health problem; Brazil ranks fourth in number of work-related deaths worldwide. Several factors contribute to impair the health of workers, such as the ones related to biotechnologies, chronic diseases and also new diseases of various origins. Several measures are currently being applied to improve occupational health, such as N-32 and training of new healthcare professionals. Conclusions: There is greater concern and innovation among organizations, including implementation of preventive measures and training as instruments to reduce occupational risks, thus contributing to the reduction of work accidents.

Keywords | risk factors; occupational health; occupational exposure; health services.

RESUMO | Contexto: Para provimento da saúde ocupacional, é necessária a promoção de condições laborais que garantam uma boa qualidade de vida no trabalho, promovendo o bem-estar físico, mental e social, prevenindo e controlando os acidentes e as doenças por meio da redução das condições de risco. Objetivo: Identificar as práticas e principais dificuldades relacionadas à gestão ocupacional em empresas de saúde. Métodos: Foi realizada uma revisão de literatura por consulta na base de dados da Biblioteca Virtual de Saúde. Utilizou-se para a busca dos artigos a associação entre os termos: gestão em saúde ocupacional, saúde ocupacional, condições de risco e segurança de trabalho. Selecionaram-se artigos científicos no idioma português, com texto completo disponível, publicados de 2008 a 2016. A análise dos dados ocorreu de forma organizada e crítica. Resultados: Foi verificado que o acidente laboral é um problema de saúde social, sendo que o Brasil é o quarto país em número de óbitos relacionados ao trabalho no mundo. Os fatores que contribuem para o comprometimento da saúde do trabalhador são diversos, como os ligados a biotecnologias, a doenças crônicas, e até a novas doenças de várias origens. Atualmente, diversas medidas estão sendo tomadas para melhorar a saúde ocupacional, tais como a NR-32 e a capacitação de novos profissionais de saúde. Conclusões: Percebe-se maior preocupação e inovação das empresas com a implantação de medidas preventivas e adoção de capacitações como instrumento para diminuição dos riscos ocupacionais, contribuindo para a redução dos acidentes de trabalho.

Palavras-chave | fatores de risco; saúde ocupacional; exposição ocupacional; serviços de saúde.
INTRODUCTION

In ancient times, work, or "tripaliari," was seen as a form of torture for slaves and poor people who could not pay their taxes. In the present time, work is a source of dignity for man, going beyond payment and respect to culminate in growth as human beings. Workers are men and women who perform activities in the formal and informal labor market to provide for themselves and their families. Global history records include the very first reports of occupational diseases, associated with the handling of toxic substances. Hippocrates (460-375 BC) described lead poisoning. In turn, Pliny (23-79 AD) expressed a concern with the protection of the work environment; for instance, he described slaves who protected their faces with pieces of cloth, as if were masks, to avoid inhaling noxious dust.

By the time of the Industrial Revolution, namely, a period of exacerbation of the relationship between work and the health-disease process, workers began to sell their work. However, along this process they became victims of the machine. Exhausting working hours in inadequate environments harmful to health were incompatible with life. Crowding in such improper environments resulted in the proliferation of diseases, while machines caused mutilation and death.

After the end of World War I, the workers' movement developed grew deep roots and gained considerable political strength. One result was the earliest campaigns for improvement of the environmental conditions at the workplace, and social security laws were proposed. The main demand was to reduce the working hours, to culminate in the quest for improved working conditions, safety, hygiene and prevention against diseases. In their struggle for life, the focus of workers' misery shifted to health, which favored the emergence of occupational medicine, occupational physiology and occupational ergonomics.

Human health in Brazil and worldwide is currently characterized as a function of how globalization and the restructuration of production are determining lifestyles and health-disease patterns among populations.

In the 1950s, major international organizations, such as the International Labor Organization (ILO) and the World Health Organizations (WHO) expressed interest in workers' health and created a Joint ILO/WHO Committee which defined the aims of occupational health.

In 1953, the International Labor Conference adopted Recommendation No. 97, which addressed the protection of the health of workers in their places of employment. After several conferences jointly held by ILO and EHO, Recommendation No. 112 was adopted. Entitled "Recommendations concerning Occupational Health Services in Places of Employment," its aims were to protect workers against any health hazard which may arise out of their work or the conditions in which it is carried on, contribute to the workers' physical and mental adjustment, in particular by the adaptation of the work to the workers and their assignments to jobs for which they are suited, and to contribute to the establishment and maintenance of the highest possible degree of physical and mental well-being of the workers.

A high-impact measure, Administrative Rule no. 3,237 was passed in 1972 in Brazil, which made occupational safety and medicine services mandatory in every company with more than 100 employees. This was the beginning of the efforts targeting workers' safety.

The Brazilian Federal Constitution from 1988 contributed to include occupational health within the legal order and made it a social right. Workers are ensured reduction of work-related hazards by means of safety and health standards.

In Santos et al.'s view, "the performance of human beings in the execution of their work activities is related to the working conditions that are imposed on them. In particular, to the organizational conditions and to the environmental and technical conditions, which determine their motivation and job satisfaction, respectively."

According to the Ministry of Health, occupational exposure to potentially infectious sources contaminated with biological materials fits with the definition of a work accident. A work accident is any event that takes place while individuals perform their jobs and cause body injuries or physiological abnormalities that might result in death, loss, transient or permanent reduction of the workers' productivity resulting from the performance of their professional activities.

As concerns the hospital setting, work accidents involving biological materials deserve special attention as a function of their frequency and severity. This type of occupational accidents is considered a medical emergency, as to improve the efficacy of prophylactic interventions against the human
immunodeficiency (HIV) and hepatitis B viruses, they must be started within few hours since contact.

The concern with this type of exposure began in the 1980s together with the spread of the acquired immunodeficiency syndrome (AIDS) epidemic, caused by HIV. This was the trigger for discussions on the formulation of prophylactic measures and clinical-laboratory follow up for workers exposed to biological materials. The biosafety measures were improved ever since to increase the protection of workers involved in the care delivered to HIV-positive patients against disease.

The professionals most exposed to these hazards at health care services are the ones involved in direct patient care. This group is mainly represented by the nursing and medical staffs, as a function of their direct and frequent contact with blood and secretions. In turn, within the hospital setting, also other professional categories are exposed to these hazards, such as cleaners, kitchen assistants, laboratory technicians and laundry workers, among others.

Inasmuch as organizations are increasingly considering the health and safety of their employees a priority, several strategies, programs and processes were developed, with positive outcomes in terms of reduction of work accidents. As examples, we might mention the System of Information for Notifiable Conditions (Sistema de Informação de Agravos de Notificação — SINAN) and Regulatory Standard no. 32 (RS-32) which establishes basic guidelines for the implementation of measures targeting the safety and protection of health care workers. RS-32 was later modified through Administrative Rule no. 1,748, which instituted the “Plan of Prevention against Risk of Accidents Involving Sharps.”

Therefore, the values related with occupational safety are increasingly aligned to the development of environments in which all workers might feel motivated to attain excellence in safety issues. This approach derives from the notion that not only the employees’ attitudes, but also their consequences should be taken into account.

As a function of the aforementioned considerations, the main aim of the present study was to investigate the practices of and main difficulties in occupational management at health care institutions. We sought to establish what management practices might be adopted by health care institutions to improve the characteristics of the work environment and minimize the risk and occurrence of occupational accidents and diseases.

**METHODS**

In the present study, we performed a literature review to analyze in depth the information on the subject of interest and develop new ideas. The literature review included the following steps: choice of subject, literature survey, formulation of the research question, literature search, analysis and manuscript writing.

The literature search was conducted on database Virtual Health Library (VHL) using structured vocabulary Health Sciences Descriptors (DeCS) and combinations of terms: management in occupational health, occupational health, risk conditions and work safety.

The inclusion criteria were: scientific articles published in Portuguese, with full text available, published from 2008 to 2016, and addressing the subject of interest for the present study.

Data analysis was performed in an organized and critical manner. The articles were analyzed in depth aiming at elucidating the subject of interest and finding associations between ideas and the results of the selected studies or reported by other authors.

**RESULTS**

The literature search retrieved 33 articles from the searched databases, with the following distribution: 7 in Scientific Electronic Library (SciELO); 17 in Latin American & Caribbean Health Sciences Literature (LILACS); 8 in the Nursing Database (BDENF); and 1 in Brazilian Psychology Scientific Journals (INDEX PSI Technical-Scientific Journals). Twenty-six articles remained after removal of duplicates. Following title, abstract and full-text analysis, 18 articles were selected for the review. As selection criteria, we included the articles that most emphasized management practices related to occupational health (Chart 1).

**DISCUSSION**

A preliminary analysis of the selected studies showed that the most common subject approached was the management practices adopted by institutions in the attempt to
## Chart 1. Selected articles.

<table>
<thead>
<tr>
<th>Articles</th>
<th>Year</th>
<th>Type of study</th>
<th>Actions and proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work accidents involving biological materials in Minas Gerais municipalities</td>
<td>2014</td>
<td>Literature review</td>
<td>Planning preventive actions and new measures facing the occurrence of this type of accidents</td>
</tr>
<tr>
<td>A contribution to workers' health: a guide on exposure to biological fluids</td>
<td>2011</td>
<td>Experience report</td>
<td>Provide grounds for workers' behavior vis-à-vis biological exposure</td>
</tr>
<tr>
<td>Implantation of Regulatory Standard no. 32 and control of work accidents</td>
<td>2012</td>
<td>Exploratory study</td>
<td>Encourage collaboration among managers, safety services and workers for promotion of health at work</td>
</tr>
<tr>
<td>Home care: risk of exposure for health care staffs</td>
<td>2012</td>
<td>Prospective exploratory study</td>
<td>Studies investigating the influence of home characteristics on risk should be encouraged</td>
</tr>
<tr>
<td>Occupational health: medical control and environmental hazards</td>
<td>2008</td>
<td>Retrospective study</td>
<td>Establish mobilization mechanisms to contribute to the quality of work life</td>
</tr>
<tr>
<td>Epidemiological analysis of accidents involving biological materials recorded at the Workers’ Health Reference Center, Londrina (Paraná)</td>
<td>2008</td>
<td>Retrospective study</td>
<td>Create spaces for broad-scoped discussions involving the health care multi-professional staff and partners</td>
</tr>
<tr>
<td>Organizational influence on the occurrence of work accidents involving exposure to biological materials</td>
<td>2013</td>
<td>Retrospective study</td>
<td>Provide grounds for the reorganization of work processes and practices within the hospital setting</td>
</tr>
<tr>
<td>Diagnosis of the management system for solid waste at the Children’s Hospital of Porto Alegre</td>
<td>2015</td>
<td>Exploratory study</td>
<td>Inform about and understand proper handling of hospital waste</td>
</tr>
<tr>
<td>Work accidents and prevention programs at a civil construction company</td>
<td>2012</td>
<td>Case study</td>
<td>Adoption of preventive measures involving low-cost technology</td>
</tr>
<tr>
<td>Formulation of the Biosafety Professional Training Program within the context of the Scientific Management Modernization Program of Oswaldo Cruz Institute</td>
<td>2010</td>
<td>Experience report</td>
<td>Inclusion of an upgrade module in continued education in biosafety</td>
</tr>
<tr>
<td>Occupational hazards and physical health of rural workers: a study on noise and thermal load among tractor operators</td>
<td>2008</td>
<td>Literature review</td>
<td>Better ways to enhance the operators’ well-being</td>
</tr>
<tr>
<td>Investigation of biological accidents among health care professionals</td>
<td>2009</td>
<td>Exploratory study</td>
<td>Better handling and disposal of sharps</td>
</tr>
<tr>
<td>Occurrence of work accidents involving potentially contaminated biological materials among nurses</td>
<td>2014</td>
<td>Cross-sectional study</td>
<td>Continued training of professionals</td>
</tr>
<tr>
<td>Epidemiology of work accidents involving biological materials among the nursing staff in a public hospital in Paraná</td>
<td>2008</td>
<td>Exploratory study</td>
<td>Improve the operators’ well-being</td>
</tr>
<tr>
<td>Diagnosis of the management system of solid waste at the Clinical Hospital of Porto Alegre</td>
<td>2015</td>
<td>Exploratory study</td>
<td>Inform on and understand proper handling of hospital waste</td>
</tr>
<tr>
<td>Epidemiological survey of occupational accidents involving biological materials among health care workers in Lagarto county, Sergipe</td>
<td>2014</td>
<td>Exploratory study</td>
<td>Training of health care professionals, use of PPE, professional education on biosafety measures</td>
</tr>
<tr>
<td>Occupational exposure to biological materials at the Holy House of Mercy Hospital of Pelotas from 2004 to 2008</td>
<td>2011</td>
<td>Cross-sectional study</td>
<td>Preventive actions involving institution and employees</td>
</tr>
<tr>
<td>Characterization of victims and work accidents involving biological materials cared at a public hospital in Paraná, 2012</td>
<td>2014</td>
<td>Exploratory study</td>
<td>Educational and training actions to improve activities and adoption of biosafety measures</td>
</tr>
<tr>
<td>Analysis of work safety and health in the state of Piauí for the period from 2010-2013</td>
<td>2016</td>
<td>Literature review</td>
<td>Initiatives to improve safety and the work environment</td>
</tr>
</tbody>
</table>
reduce hazards in the work environment. Less emphasis was given to subjects related with detection of biological hazards and sharps injuries. The proportions of these two groups of studies were 56% and 44%, respectively.

According to WHO, the most important — imminent and predictable — challenges for occupational health are: occupational health problems linked with new information technologies, new chemical substances and physical energies, biotechnologies, aging of working populations, special problems of vulnerable groups (e.g., chronically ill and handicapped) and new occupational diseases of various origins.

Work accidents are legally defined in Law No. 8,214/91 art. 19, in which they are characterized as such events “which occur as a function of work performed for a company or the work performed by the insured described in art. 11, item VII of this law, and cause injury or functional disorders causing death, loss, permanent or transient reduction of the ability to work.”

Work accidents became a serious problem for society at large. According to ILO, the annual number of victims of work accidents is over 317 millions worldwide. Brazil ranks fourth in annual number of deaths; more than 2,500 were due to work accidents in 2010.

Work accidents involving exposure to contaminated biological materials, such as blood and body fluids, are frequent among health care professionals as a function of the peculiar characteristics of the procedures they perform while delivering care to patients and the working conditions under which they perform their work.

According to WHO, among the full global population of health care workers, about 16,000 become infected with the hepatitis C virus (HCV), 66,000 with the hepatitis B virus (HBV) and 1,000 with HIV every year. These data point to a substantial and highly significant problem, which might result in disability, disease and impaired quality of life. Although the risk of work accidents is well documented, many workers fail to and/or make inadequate use of personal and/or collective protective equipment on a daily basis, thus increasing their vulnerability and exposing themselves to health hazards.

RS-32 has much contributed to reduce the occurrence of accidents. Several among the measures established in it are helping reduce sharps injuries: employers should replace sharps by equipment with safety devices and provide the employees training on their use. RS-32 further indicates how to handle and use cleaning supplies and tools in a way to preserve the physical integrity of workers. It should be noticed that all these measures also apply to outsourced workers.

The study by Figueiredo and Maroldi on home care showed that care delivery should comply with the same requirements as in the hospital setting as concerns occupational accidents. These authors founds that nursing professionals are the category most exposed to hazards, in agreement with the literature. As main reason for the study findings, the authors named the application of dressings, mainly to pressure ulcers, in the course of which professionals become exposed to body fluids and blood, in addition to the use of scalpels (during the procedure and then on disposal).

A similar study was conducted by Iwamoto and colleagues in which 60.14% of the sample corresponded to professionals (nurses, nursing technicians and assistants) exposed to biological hazards mainly allocated to the departments of clinical pathology, surgery and anatomy, among others. The smallest proportion of employees was exposed to physical and chemical hazards (1.65%) corresponding to pharmacists, investigators and professors.

The data described here point to the relevance of the training of health care professionals as concerns the hazards to which are exposed at the workplace. And more particularly, nursing professionals, as their work routine includes invasive procedures, and they tend to neglect the biosafety measures. In addition, institutions should performed detailed studies of work processes associated with occurrence of occupational accidents.

Adherence to precautions at work is the main strategy to protect workers exposed to transmissible pathogens, as well as for the protection of patients. However, the current levels of adherence are below the recommended ones. Several authors observed that training and adequate knowledge on the subject positively influence the adherence to safety measures. Adherence to safety measures is higher at large compared to small-size services. This fact might attributed to the action of hospital infection control committees and/or financial investment in institutional preventive actions.

Data reported in the study by Iwamoto and colleagues corroborate the low rates of adherence to these practices.
These authors investigated the acceptance of management practices adopted by institutions to reduce occupational accidents. The results showed that 52.05% of the employees did not comply with the activities established in the Occupational Health Medical Control Program (Programa de Controle Médico de Saúde Ocupacional — PCMSO). Also the adherence to programs for vaccination follow up, encouragement of use of personal protective equipment (PPE), orientation on sterilization and disinfection of materials and seeking to improve the occupational environment and health was low.

As concerns the workers’ perception of biological hazards, most are aware of the risk to which they are exposed and admit that attention in the execution of activities is crucial. Accidents are multicausal, and also a consequence of individual behavior.

Many companies have already realized that healthy employees are more productive and generate less costs. As a results, several organizations and governments are increasingly concerned with the health of workers, as the latter’s well-being directly results in competitive leverage for companies.

One of the analyzed studies evidenced greater concern of a hospital with the quality of notifications. This is one of the main problems faced by health care services. According to Marziale et al., when there is no information on the use of PPE at the time of an accident, neither the Specialized Service in Occupational Safety and Medicine (Serviço Especializado em Engenharia de Segurança e em Medicina do Trabalho — SESMT) nor companies are able to plan their actions in an efficacious manner. As a result, an instrument for complete formal investigation of accidents was implemented at this hospital. This is an initiative to improve the quality of notifications by means of a data collection instrument available online. Its use might contribute to the performance of complete investigations of accidents and to formulate efficacious measures for promotion of workers’ health.

SINAN was created to gather data from all across the Brazil; it includes an online form specifically for notification of work accidents involving biological materials. The Network for Prevention of Work Accidents involving exposure to biological materials (Rede de Prevenção de Acidentes de Trabalho — REPAT) is another initiative that might help improve the quality of notifications. REPAT enables Brazilian hospital safety services register in the online network and notify the accidents that took place in the corresponding services.

Reports in the literature confirm the investments made by companies in the training of their employees. One example is the Scientific Management Modernization Program of Oswaldo Cruz Institute (Instituto Oswaldo Cruz — IOC). This Program was precisely designed to meet this need (natural within the current scenario of increasing competition) of science, technology and innovation (ST&I) organizations seeking to ensure the availability, integration and divulgence of knowledge by means of training as main strategy.

The training provided at IOC resulted in changes of the workers’ behavior, even if only indirectly, among which the following are quite interesting:

- increased consumption (21.46% along a six-month period) of PPE, such as disposable coats, procedure gloves, nitrile gloves and masks;
- increase in the number of requests of biosafety accreditation for IOC laboratories for the purpose of handling genetically modified organisms, in compliance with Law No. 11.105/05;
- faster filling of places in courses.

The human factor is crucial as concerns prevention. Employees need to feel they are part of the company and that they work in safe and wholesome environments. When a company succeeds in awakening such feelings, its employees will certainly cooperate more easily, and consequently the number of accidents will decrease. Prevention might be considered as being more related to educational programs for defining and maintaining values, than to technical programs.

Unsafe actions characterized by neglect and imprudence, potentiated by the employees’ failure to comply with institutional standards and with the instructions for handling and disposing of materials, are factors that should be addressed and analyzed. Within this context, didactics — involving educational measures centered on the main risk factors associated with occupational accidents — contributes to the awareness on PPE and its relevance among employees. Therefore it represents an extremely relevant tool for establishment of preventive measures targeting this population of workers.
Every accident prevention program should consider two fundamental aspects: the human, with the concerns focusing on the well-being and preservation of the lives of workers, and the economic, as a function of the costs of absenteeism due to work accidents, which might be very high.

The cultural, social conditions and working conditions at organizations need to be reinforced through preventive actions to eliminate unsafe actions or working conditions. The formulation of preventive policies should always be based on the respect for individuals and result in the elimination of noxious effects on their health. Work safety and health issues should include all — management and employees — in the attempt to reduce hazards.

CONCLUSION

The need to invest in occupational safety and health management systems is patent, since the number of work accidents at health care services is alarming, and such accidents lead to complications that impair the physical and psychological integrity of workers. We call the attention to the high prevalence of accidents resulting from exposure to biological materials, such as blood and body fluids, and to sharps.

A significant part of the analyzed studies evidenced increase in the interest of institutions in implementing preventive measures, such as: compliance with RS-32; development of protocols to be followed by employees; identification of hazards to which employees are exposed in and outside hospitals; and notification of occurrences. These practices culminate in investment in training, which is doubtlessly the basis to change the behavior of workers. The reason is that once they become aware of the occupational hazards to which they are exposed, they adopt the measures intended to control them.

It is worth observing that the approach in occupational safety and health and occupational medicine is no longer restricted to the collection of statistical data nor to actions in response to work accidents. Companies have innovated and are assuming their due responsibility in the attempts to reduce the occurrence of accidents among their employees.

REFERENCES


Correspondence address: Kedma de Magalhães Lima – Avenida José de Sá Maniçoba, s/n – Campus Universitário, Centro – CEP: 56304-917 – Petrolina (PE), Brazil - E-mail: kedma.biom@gmail.com